COAL AGE

Vol. 4 NEW YORK, AUGUST 9, 1913 No. 6

Have you ever realized the value of *expressed appreciation* as an aid in the successful handling of your employees? We are all too prone to be thoughtless in observing the little amenities that lubricate life's machinery.

Real men do not exact or expect much in the way of appreciation—they are accustomed to bestow rather than receive—yet a certain amount of praise and thanks is always welcome to the diligent and faithful.

Appreciation is not, like the exercise of many virtues, difficult and painful, but is attended with so much pleasure that were there no positive command which enjoined it, nor any recompense laid up for it hereafter, a generous mind would indulge in the practice for the natural gratification it brings.

Have you ever considered the possibility of capitalizing the loyalty of your co-workers and subordinates through the expression of your appreciation of their meritorious efforts when they strive to win your approval? We do not mean in a purely mercenary sense, but as a means to bring out the better side of human nature, and to develop talents that lie dormant because you have failed to encourage well directed effort.

Do you realize that many men are discouraged because their work has not elicited the expressed approval of their superiors? And, oftentimes feeling that it would be unappreciated, they are deterred from applying their personal initiative to the solution of problems which confront them.

Look around in your own industrial circle and see if it is not the man who judiciously expresses his appreciation of the work of his employees who is supported by the most loyal and efficient organization.

The ability to bestow a word or look of approval at the proper moment is often the determining quality in individual success.

If you lack sympathy, the men about you will reflect your spirit; they will not exert themselves to further your interests. It is also true that an unappreciative employer is generally an undervalued individual, and his organization is usually inefficient, due to internal dissensions.

If you are one of those men who appreciate good work, but have not realized the value of expressing your thought, commence a new policy at once. Perhaps you will soon learn why you have not had the cordial support of your subordinates, or maybe you will discover why you lost a valuable employee to a nearby competitor.

Men are anxious to work for the fellow who gives credit where credit is due. Such an employer always has able applicants on his waiting list. A boss can often do more good by the exercise of sympathy than by his labors, and he can render the world a more lasting service by the recognition of merit than he could ever render by the straining efforts of personal ambition.

To the great majority there come hours when life loses its song. Every man has moments when the iron seems to disappear from his blood. *Meet the next deserving but disheartened employee who comes into your office with a word of appreciation, and if the change in his demeanor and the lightness of his step when he leaves don't repay your effort, then we surely miss our guess.*

IDEAS AND SUGGESTIONS

The Liquor Problem in Mining

By Mine Superintendent

I have been a constant reader of Coal Age from the beginning of its history, and have noted with much interest the pages devoted to "Discussion by Readers." The various articles relating to the "Liquor Problem in Mining," have been of especial interest to me.

This interest is, no doubt, augmented by the fact that the "liquor traffic," and especially the "beer wagon" end of it, has been one of the most serious problems in the management of the properties over which I have the supervision; in fact, from the beginning of our operations until the present time, the beer wagon has been a constant menace, and is annually costing our company thousands of dollars.

In the earlier stages we were sometimes able to bluff the drivers and by threats of law enforcement keep them off the property for limited periods, but in a short time some new driver would make a trip, and as it is impossible to at all times keep a close supervision over the houses, would make deliveries, and a shut down, or operation with a reduced force of men, at greatly increased expense to the company, would be the invariable result.

We are located in a "dry" township, with seemingly no restrictions on the liquor traffic, except that no licenses are granted. Trucks and wagons delivering beer are a daily evidence that the solicitor is getting in his work and that the will of the majority who have voted the township dry is being defeated, and that there is either no law covering the situation, or that such a statute is not enforced by those whom we have elected to enforce the law, and whose oath of office binds them to such a course of action.

I have personally appeared before the district attorney of the county in which we are located, with names of persons who would testify to giving their orders and money to a solicitor, and to the beer being delivered to them by wagons within a few days, and have been told that we could get no prosecution in such cases, as it is impossible to prove a sale.

Travelers along the county road can see large piles of full cases and kegs left there by the trucks for the delivery wagons, or empties gathered by the deliveryman ready for the truck to return to the brewery.

Now my claim is that the liquor traffic is a menace to the coal operator, and a serious handicap in the working of mines. Furthermore, the law should be enforced in order that we may successfully operate our mines six days per week.

As a mine superintendent, I am expected by my employers to get results, and have a right to their aid and coöperation in making working conditions such that results will be obtainable. Yet the great body of coal operators who have power or influence in political affairs, do nothing to bring about the prohibition of this traffic that is lessening their profits, restricting their output, endangering their property and the lives of their employees. They are thus placing, or permitting to be placed a serious handicap upon every superintendent and foreman they put in charge. I feel that coal operators should, in justice to their investments, their management and their many employees, unite in their efforts to eliminate this traffic, which is doing more than any other one agency to restrict output and increase the cost of production.

Some Plain Facts about Anthracite

By Special Correspondent

How passing strange it is how long an evil reputation, no matter how undeserved it may be, will cling to a person, a business or an institution, even surviving long after all of the original parties to it are dust.

That applies cogently to the anthracite-coal industry, as both miner and operator have, as a whole, been the objects of severe and wholly undeserved public censure, because of the actions of an almost negligible portion of each. In the mind of the general newspaper reader the anthracite-coal operator is pictured as a combination of bandit and Shylock, battening upon the necessities of mankind, extorting the last penny from the poor on one hand and heartlessly oppressing and plundering his employees on the other.

A patient and unbiased investigation will reveal that 99 per cent. of the above picture is colored with wanton falsehood, frank ignorance and the political necessities of demagogues who seek to ride into office by advocating chimeras or by posing as the miners' friend and creating hatreds between employer and employee as a sign of their good intentions toward their clients. It is one of the unsoluble enigmas of our day that the more lurid and baseless an attack on an anthracite operator is, the more it is welcomed and the more prominence is given it in the columns of the press, while colorless truth and exact facts set forth by the operator are given little or no credence in the newspaper sanctums, and if referred to at all editorially, usually with a mingled sneer and derisive incredulity, the operator being held as a scoundrel *per se*.

About every demagogue in Congress, in the various state legislatures and in the city councils, has offered a "resolution to investigate the anthracite-coal monopoly," as though there were one, and said demagogue is prolific of sentiments saturated with libelous and unwarranted adjectives portraying the operator as the sum of unvarnished saturnine villainy.

In the loose terminology generally employed in discussing the anthracite situation, that industry is habitually written or spoken of as a "trust." The statement has no foundation in fact, save that created by nature herself, the inventions of mine appliances and the legislative enactments in behalf of the mine worker. Those three things are solely responsible for whatever resem-

blance the industry has to a trust. That can be proven as clearly as a problem in Euclid.

While hunting in 1792, Philip Ginter built a camp fire and accidently set fire to the "black stones," lying loose on Moosic Mountain. That was the genesis of the anthracite-coal industry. Its progress was slow, for in 1814 Jesse Fell, a pioneer operator, recorded in his diary that he had sold 50 tons, while the year previous his sales were but 22. It may be set down as an irrefutable fact that for a century after its discovery the investor in an anthracite-coal mine had about the same chance to get principal and interest back, as the usual run of "birdmen" have of safely returning to earth. There were enough exceptions to prove the rule, of course, yet until 1892-5, when the large anthracite properties were virtually forced upon their present owners by bankrupt and disheartened investors, the stocks of the general run of anthracite-coal companies were shunned by far-sighted and prudent investors.

The truth of the matter is that the present owners of the mines, continually spoken of as a trust, were very reluctant to invest in the mining properties at all, and the stocks were virtually forced upon them. No secret is betrayed when it is declared that the men who disposed of their stock to the supposititious "trust" believed, as some of them also stated, that they had gotten rid of a "dead horse." It is one of the peculiar facts of that sale that one of the three men principally responsible for the selling owned the newspaper which has been the most persistant and virulent critic of the "anthracite coal trust." There is a tale connected therewith which, if set forth plainly, would throw a flood of light upon business, political and financial affairs in Pennsylvania.

In reply to the criticism, iterated and reiterated ten thousand times last fall and winter, that the "anthracite-coal trust was extorting exorbitant prices for coal from the poor," the operators in sober truth replied that "no change whatever has been made in circular prices;" still the charge was made.

To the further assertion of the operators that by buying a supply in summer, the consumer would not only get coal cheaper, but he would also prevent any chance of a "coal famine" in cold weather, the "learned Thebans" of the press reply that the poor man has neither the cash to buy a supply nor a place to store it. To this branch of consumer then we will try to show plainly that the operator has no part whatever in causing him to pay more than a fair price for anthracite coal.

Standing on South Halstead Street, Chicago, I heard the following colloquy between a woman who sought to buy some coal and a retailer who, among other commodities, sold coal by the pail and basket.

"What," asked the woman, "is the price of a basket of hard coal?"

"Forty-five cents delivered, or forty cents if you take it yourself," replied the dealer.

"How much does it weigh?" queried the woman.

"Fifty pounds, full weight," answered the dealer.

The woman bought a basket and asked why coal was always getting higher in price, to which the dealer replied by emitting the usual tirade against the operator, the least objectionable term he used in characterizing the coal producer being that of "robber," and at the same time he expressed the greatest sympathy with the poor.

Outwardly I paid no attention to the transaction or conversation, but upon my return that evening I bought a basket of coal, which the dealer repeatedly told me was the genuine Scranton hard coal. Upon weighing it at home, I found it was four pounds short in weight. That is to say, I paid at the rate of $17.38 for 2000 lb. of "genuine Scranton hard coal."

But the short weight was not the worst part of the transaction by any means. Taking the coal from the bag, I spread it out on a paper on the floor and found that a little over half the coal was Indiana block coal, screened to the chestnut size. Now examine the proposition in its true light.

The Indiana block coal cost that small dealer $4 per ton from the retail coal yards, while the "genuine Scranton hard coal" cost him $8 per ton at the lake front. Let us say, in order to be within the truth, that that basket of coal was mixed with equal parts of both kinds of coal, then that small dealer got $17.38 for coal that cost him but $6.

That transaction aroused my curiosity, and I made a searching examination among that class of coal dealers, calling on over thirty petty salesmen in various parts of Chicago, and short weight was an almost unbroken feature. Where coal was bought by the bucket, the rate at which it was sold was seldom under twenty dollars per ton.

Another almost universal feature was that these petty dealers never lost a chance to defame and vilify the operator, whether the coal sold was anthracite or bituminous. Do not for a moment think that the retail dealer with a yard and scales of his own resorted to any such practice or used any such language. It was in all cases a dealer whose stock seldom reached ten tons at a time.

It is within the bounds of truth to say that fully twenty-five thousand families in Chicago buy their coal in that way, and are habitually subjected to short weight and extortions and the extortioner invariably places the blame upon the operator. Just as a wave widens when a stone is thrown in a body of water, so the multiplicity of these baseless charges have created a wave of resentment and ill-will toward the coal operators that finds expression in editorial comment and the senseless and crippling legal enactments which create the very conditions their authors design to prevent by them.

The Cost of Bath Houses

The cost of installation of baths and fittings does not vary much, according to William Walker, Division Inspector of Mines for Scotland. In Germany the average cost is $25 and in Belgium $20 per person using the facilities. One bath house in Belgium, which was 123 ft. long by 74 ft. wide by 39 ft. high, and was completely fitted out with walls of glazed brick, cost $24,000. This accommodated 800 men. The Belgian law has the peculiarity that the men are not permitted to bathe in sight of one another, but each must have a separate compartment in which to take his bath.

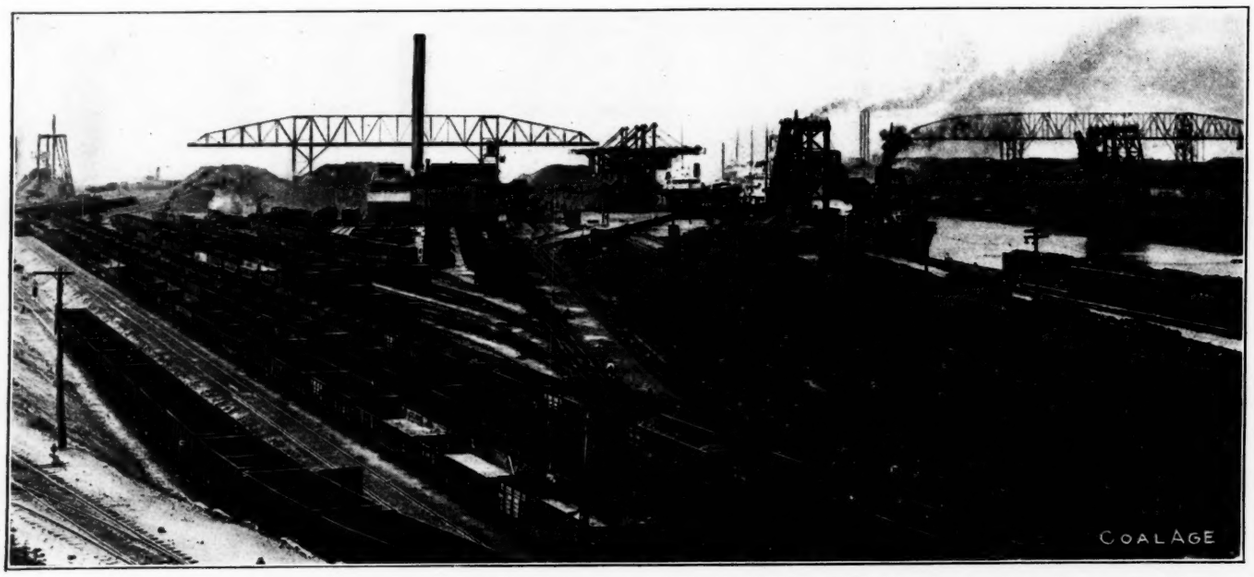
A bath house in Westphalia which was built of a size to allow 2000 men to bathe in three-quarters of an hour, cost $50,000. At the Wharncliffe Silkstone Colliery in England a bath house was built at a cost of $3000, having 14 baths and 48 lockers. The cost of upkeep of this bath house is about $7 a week.

Coal Shipping on the Great Lakes

By J. W. Chamberlin*

SYNOPSIS—The movement of coal up the Lakes during the summer season is one of the most interesting transportation problems in the coal industry. The Lake shippers believe they have the most advanced and modern systems of handling coal. The necessity of such is obviously much more essential, due to the short haul and relatively greater proportion of time required in loading and unloading. This is the first of a series of articles that will discuss all phases of the Lake trade.

The coal trade of the Great Lakes, although comparatively new, has already attained to great proportions. Pennsylvania produced less than 2000 tons in 1820, but as there are no mines within mule-hauling distances of the Lakes, it is certain that the railroad, in 1830, must have preceded that traffic. "Railroading" began with the completion of the Erie to Dunkirk on Lake Erie in 1851. The first real incentive to lake navigation, at least from one lake to another, must have been given by the growth of Chicago, which was not settled till 1831.



Ashtabula Harbor, One of the Largest Coal and Ore-Handling Ports in the World

Early History of Lake Transportation

There was, however, a big impetus given to the coal trade by the opening of the Erie Canal, connecting the lakes with tidewater, in 1825. Coal, practically all anthracite, came to be one of the common articles carried by the canal. It was taken by canal-boats in probably not more than 100-ton lots to Buffalo, where it was hoisted by derrick to the lake wharf and was loaded on sailing vessels for the most part with wheelbarrows. An old Buffalo ship-store owner states that once a very big record was made by the wheelbarrow process in loading the ship "Erastus Corning" with 1400 tons of coal in 14 hours!

Lake vessels are now being loaded at the rate of 1000 tons an hour. Buffalo in those days received anthracite by canal through Seneca and Cayuga Lakes and from Rondout on the Hudson. It appears that since the days of the "Erastus Corning," which was built in 1867, both carrying and handling capacity have increased tenfold, for there are quite a number of modern steamers that will carry more than 14,000 tons of bulk freight on maximum draft. It is, of course, the shallow depth of the lake harbors and connections that makes it necessary to build all lake craft so broad and flat and which unsuits them for ocean carrying and *vice versa*, except in a limited way. Sometime in the '80's the steamer "Roanoke" was brought up from Tampa Bay to the lakes, and, though she could load down to about 26 ft., she could hardly get into any lake harbor with a cargo of more than 600 tons.

Water Depths and Methods of Handling Coal

As a rule, all lake craft must be loaded to a depth of less than 20 ft. and there are a good many harbors, especially in the upper-lake lumber districts, that are not more than 15 ft. deep. In these the primitive "horse dock," the terror of the coal shipper, still prevails. The vessel must wait for its coal to be hoisted out by a bucket moved by horses so that extra freight paid, at least 10c. a ton, is demanded to these points, with tonnage hard to get at any rate. Such shallow harbors are disappearing now, however, for if there is natural traffic enough to warrant the outlay they are deepened, and if not they are soon distanced by the rush of improvement elsewhere. The report from the two inter-lake passages, on which the shipmaster relies for his depth of draft (the Lime Kiln crossing below Detroit and the Poe Lock at Sault Ste. Marie) for the opening of this season, makes the former navigable at 20 ft. and the latter at 18.08 feet.

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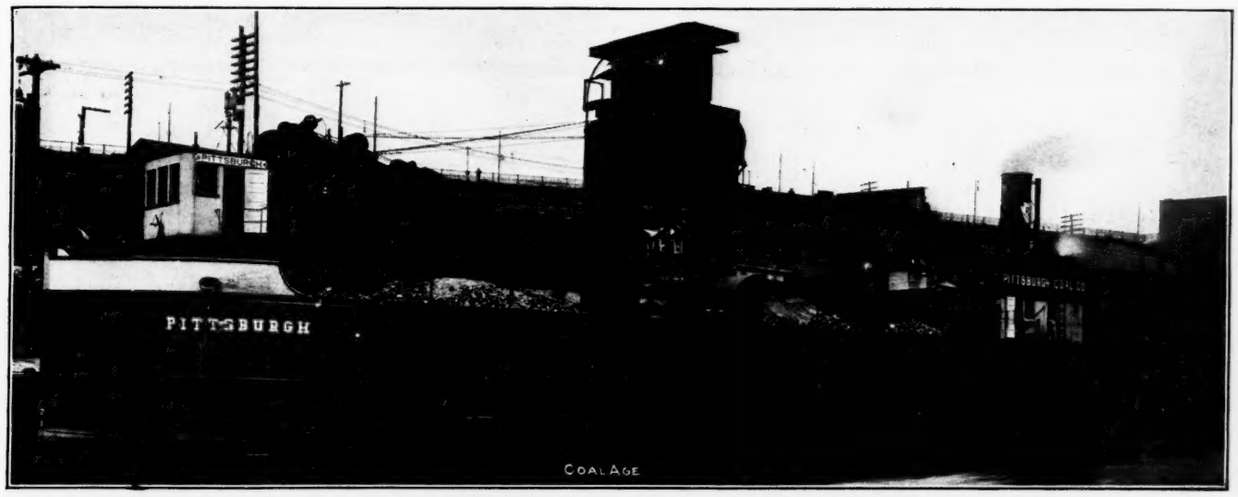


THE PITTSBURGH COAL CO.'S FUEL LIGHTER "PITTSBURGH"

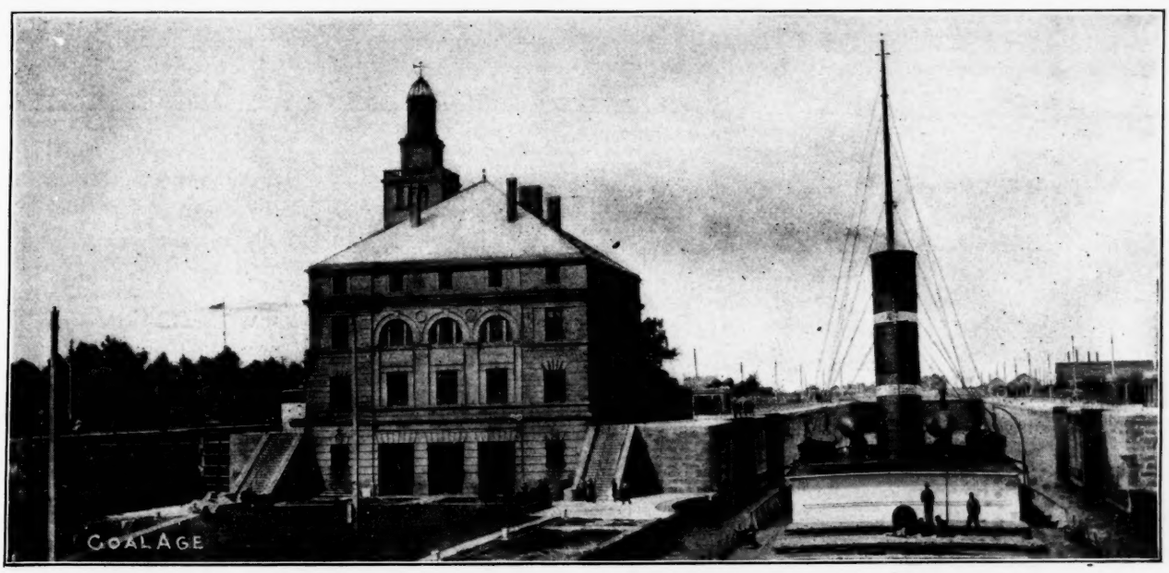
Up to the organization of the Lake Carriers' Association at Buffalo in 1885, the government had given anything but cordial aid to lake navigation, the tidewater and general Eastern and Southern marine interests claiming the lion's share of assistance and getting it. Since that time, government aid has become much more liberal all over the lakes, till they now boast many important improvements, such as the Poe Lock at the Sault, the Livingstone channel in Detroit River, the Straight channel at Toledo, the four-mile breakwater at Buffalo, etc. All these assist navigation in some special way, largely by deepening draft. The much-canvassed Chicago drainage canal, government permission for which was given in 1901, should have a tendency in the opposite direction. The Lake Carriers' Association, in a recent report, gives some color to the belief that it reduces lake levels from 0.5 to 0.8 ft. Natural causes so influence these levels that it is not easy to determine the amount.

The anthracite trade by lake early found that the best method of handling from car to vessel was by trestle, the loaded cars being run upon it by locomotive or stationary machinery and the coal dumped or shoveled into the pockets beneath, from which it is rapidly spouted down the hatchways of the vessel. The trestle of the Delaware, Lackawanna & Western, at the mouth of Buffalo River, is an excellent example in this line. This trestle was built in 1879 and is now the oldest of its kind in Buffalo. It has 41 pockets, which vary in size according to the elevation of the tracks above them; these latter are laid on a gravity plane to facilitate the moving of a car after it is hoisted to the top of the trestle. The entire pocket capacity is about 4500 tons, the iron-lined wooden pockets being filled from three parallel tracks.

LOADING TRESTLES

When the lake craft was comparatively small it was easy to spout the coal into the hold from the pockets, but the decks of the 400- and 500-ft. steamers, when light, are much higher from the water, so that it is now occasionally found necessary to adopt various devices to list them over so the coal will flow down the spouts.

There are now four water-shipping trestles in Buffalo

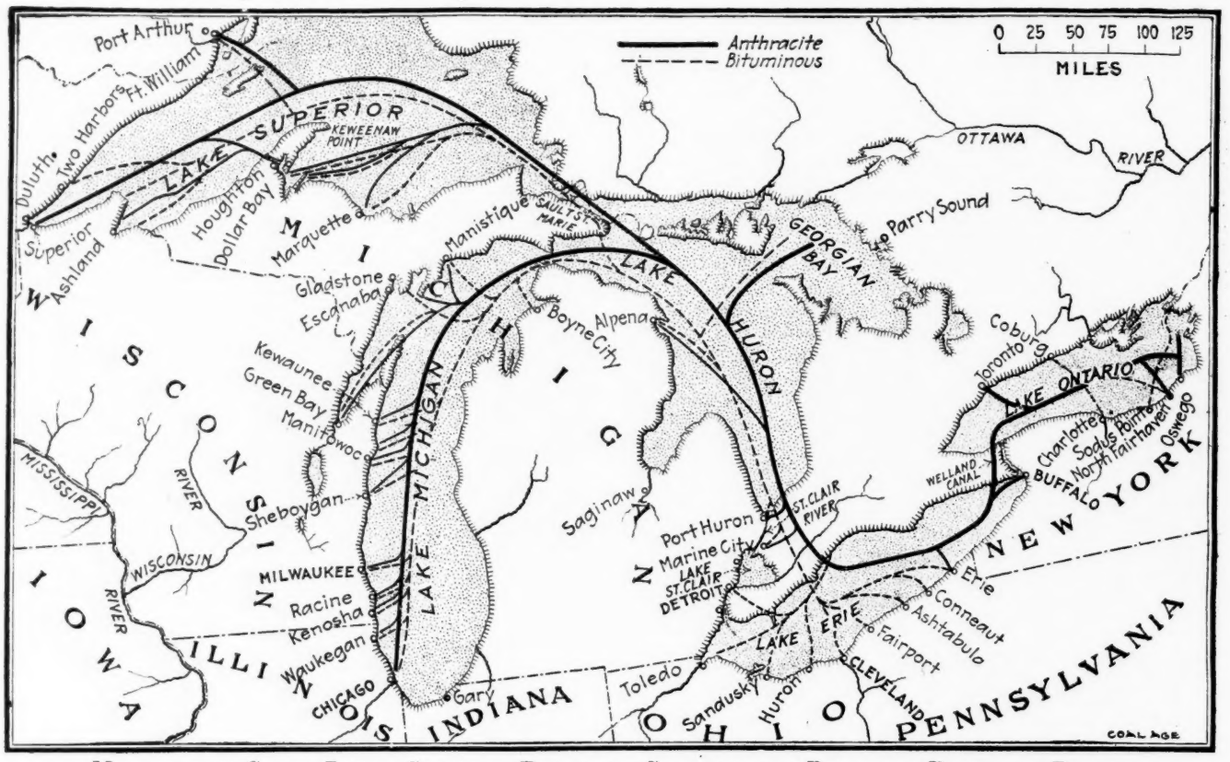


STEAMER "SULTANA" OF THE TOMLINSON LINE PASSING OUT OF THE AMERICAN "SOO" LOCKS

Harbor, the Delaware, Lackwanna & Western just mentioned, the Lehigh Valley, the Erie (operated by Williams & Peters) and the Philadelphia & Reading. All hoist the loaded cars by stationary machinery, except the last named, which is operated by a locomotive incline. There are also a number of docks or trestles for fueling the steamers, including those of Frank Williams & Co., E. L. Hedstrom, Pickands, Mather & Co. and the Buffalo, Rochester & Pittsburgh R.R. The coal (always bituminous) is dumped into small pockets from the cars, whence it is drawn out into five-ton iron buckets and hoisted to the flat deck of a fuel scow, which is then towed to the lake steamer, or propelled by its own steam, and the buckets dumped into the bunkers. This is an improvement over having the steamer to go to the fuel dock for bunker coal, especially in the saving of time. Where the steamer takes a cargo of coal the fueling is done from the trestle that furnishes the cargo.

Buffalo does not ship bituminous coal by lake. Rail freight rates are too high, as compared with those to Erie or the Ohio ports. The rate from the Allegheny Valley mines to Buffalo is $1.10, as compared with 78c. from Pittsburgh to the Ohio ports, and a still lower rate has been made this season to Erie. Quite a number of years ago the Rochester & Pittsburgh, having its own coal and railroad, undertook to meet this competition and one season shipped about 150,000 tons of bituminous by lake, but it dropped out of the business after two or three seasons. The only port that ships both anthracite and bituminous extensively by lake is Erie, which till lately used the trestle chiefly for anthracite and the car dump for bituminous. There are no car dumps in use at lake ports below Erie. The Buffalo, Rochester & Pittsburgh R.R. put one in at Buffalo for loading its bituminous lake shipments, but took it out on retiring from that trade. Though either sort of coal could be handled by either trestle or dump, the conditions favor the trestle for anthracite and the car dump for bituminous.

The coal trade of Lake Ontario is in a peculiar condition. It is essentially separated from the other lakes by the fact that the Welland Canal connecting it with Lake Erie and the upper lakes admits vessels of only about 14 ft. draft and there are but few that can load more than 2000 tons on that draft and at the same time accommodate themselves to the canal locks, which are only 270 ft. long by 45 ft. wide. On that account the trade of Lake Ontario is largely confined to ports on that lake or on the St. Lawrence River, though two or three shippers of anthracite at Oswego still send cargoes to the upper lakes. For instance, of the 686,417 gross tons of anthracite shipped in 1911 from Oswego, 209,948 tons cleared for the upper lakes. The other ports on that lake, North Fairhaven, Sodus Point and Charlotte, practically confine their operations to ports below the Welland Canal.



MAP OF THE GREAT LAKES SHOWING PRINCIPAL SHIPPING AND RECEIVING PORTS AND ROUTES

On this account the tonnage on Lake Ontario is very small, cargoes often running down to 200 or 300 tons and vessels hard to get at that. Still the coal trade on that lake keeps up and in some instances increases. Anthracite shipments from North Fairhaven were 100,000 tons in 1911 and 150,000 tons in 1912, and the other shipping ports were holding their own well. There are three shipping trestles at Oswego, the New York, Ontario & Western, the Delaware, Lackawanna & Western and the Delaware & Hudson, the last not shipping heavily by water since the opening of its rail line to Montreal. Anthracite only is shipped from Oswego, and this is also the chief product shipped out of North Fairhaven, where the Lehigh Valley Co. has a trestle. The principal shipments from Sodus Point, where the Pennsylvania R.R. has a trestle, are bituminous. At Charlotte the Buffalo,

Rochester & Pittsburgh R.R. and the Grand Trunk Ry. operate a joint car ferry to Coburg, Canada, which handles practically all the water coal there; this was formerly about all bituminous, but it is reported that the anthracite shipments will be increased this season. The ferry runs all winter.

Freight Rates

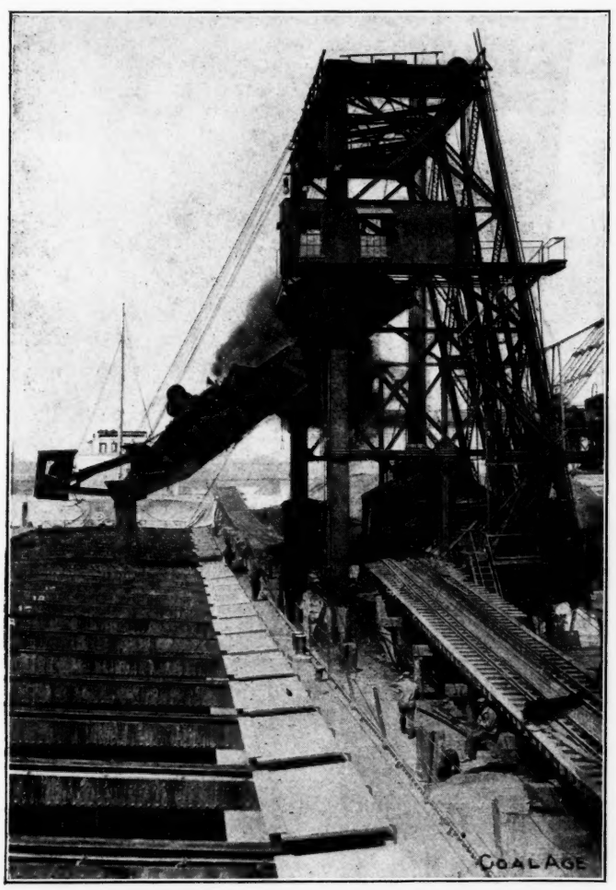
There has been little change in the numerous receiving coal ports on Lake Ontario and the St. Lawrence River in late years. Most of them receive coal in small amounts, the leading ports being Montreal and Toronto. Hamilton, a large coal port some years ago, has shifted to all-rail traffic. Canadian consumption of Pennsylvania coal is increasing, and it appears that the Lake Ontario route is to get its share. There is much need of more tonnage and larger vessels. Some shippers in Buffalo and elsewhere not long ago became tired of conditions on Lake Ontario and sent their coal to Erie, Conneaut and other Lake Erie ports, for shipment to the Lake Ontario district, but rates have gone up so sharply that they are likely to return to the old routes. The water rate from Lake Ontario to the upper lakes is usually 40c. a gross ton over the Buffalo rate; other rates vary. Buffalo water rates are always reckoned per net ton.

Coal-freight rates from Lake Erie have undergone a great decline in recent years, though anthracite and bituminous freights do not differ much during the same season. The palmy days of the wooden vessel, commonly a steamer with one or more consorts, was in the '80's, coal rates reaching their maximum about 1888, when the rate, Buffalo to Chicago, was 75c.@$1; to Milwaukee, 75@90c.; to Duluth, 50@60c.; to Toledo, 25@50c. But the steel vessel was already in the trade and making itself felt, so that the rate in 1889 fell to 45@60c. to Chicago and Milwaukee and 25@50c. to Duluth. From that time the decline was steady, settling down early in this century to 40c. to leading Lake Michigan ports and 30c. to Duluth and most other Lake Superior ports.

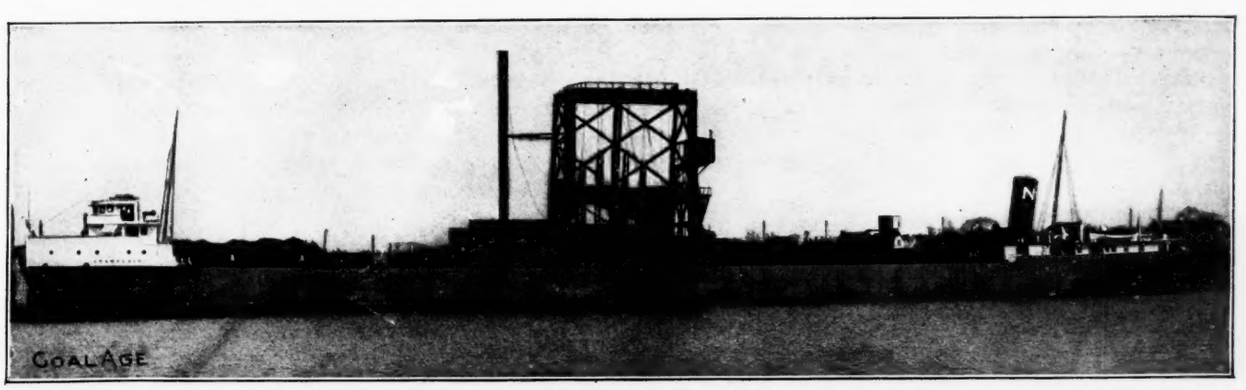
Moreover, these later rates are practically without fluctuation the season through, for they are entirely controlled by the shipper; because of the large amount of tonnage between Lake Erie and the upper lakes, a high rate is possible only just at the close of the season, when none but the more venturesome of vessel owners would send a steamer out. In the old days the situation was largely controlled by the vessel, as the tonnage was generally inadequate to shippers' needs and was always in demand. For this reason fluctuations in rates were often of almost daily occurrence.

The lake trade has almost always been highly profitable to vessel owners until quite recently, one reason being that it has been easy to obtain full cargoes both ways. Perhaps for the money invested and the simplicity of the undertaking no traffic in fairly recent times was more satisfactory and generally profitable than in these same '80's, when the "canal-schooner" trade was so brisk between Buffalo and Toledo. The up-trip, just the length of Lake Erie, was made with 600 tons of coal at 50c. a ton and the return with 20,000 bushels of wheat at 2@3c. a bushel.

(To Be Continued)



The T. & O. C. Car Dump at Toledo, Ohio. Capacity 12,000 Tons per Hour



Freighter "Champlain," 8500-Ton Capacity, Loading at the T. & O. C. Dock at Toledo

Coal-Cutting Machinery in England

By Sydney F. Walker

SYNOPSIS—A résumé of some of the circumstances and conditions which have made the introduction of coal-cutting machines rather more backward in England than it has been in this country.

Coal-cutting machines have been employed to a much larger extent in America than in either the United Kingdom or in Continental Europe. Americans, as a rule, appear to be able to use and handle machinery that has been designed to economize labor, much better and more intelligently than the bulk of men who are employed for the same purpose in the countries east of the Atlantic.

The compressed-air coal puncher which has been largely used in America, has almost entirely failed in England, and at the present time there are but few of these machines in use in the United Kingdom.

A machine, which has taken the place in Great Britain which appears to be occupied in America by the puncher, is the radial coal cutter, which goes by various names. It is really a precision drilling machine, arranged to sweep out an arc in any direction; horizontal, vertical or at any angle that may be desired. In narrow working places, such as are employed in the north of England, it is nearly always necessary to "nick" the coal, as it is termed. This is to cut a vertical incision on each side of the working face as well as undercut it, in order to minimize the use of explosives and bring down the material in convenient form. The radial coal-cutting machine, which may be taken down until the parts can be easily carried from place to place, is handy indeed for nicking as well as undercutting in this class of work.

Practically the only reason for the employment of coal-cutting machines in the United Kingdom is the reduction in cost which may be effected. Take, for example, a seam of coal 18 in. thick in a certain Yorkshire colliery, the cost for undercutting by hand was $1.75 per ton; this expense was sufficient to practically debar the coal from the market. When the diamond disk machine was introduced, the cutting cost was reduced to 75c. and the whole of the seam in question could then be worked and sold to advantage.

Machines Produce Less Slack

Some years ago, it was claimed by the makers of coal-cutting machines, and this claim has been borne out to a large extent by experience, that a much smaller proportion of fine coal was made by a machine than by hand cutting. This, of course, is a natural result. The disk or bar machines cut a kurf under the coal of just sufficient vertical height to allow the passage of disk or bar and provide for the coal coming down. Except where the ground is much broken up by nodules of iron pyrites or by irregularities in the strata, this kerf is fairly uniform in section.

In order to cut well under the coal, in hand mining the miner is compelled to remove a sufficient quantity to allow his head and shoulders going under the outer edge of the face. He must also chip out enough material to allow the swinging of his pick. Such a process necessarily produces a large amount of slack.

After the successful introduction of coal-cutting machines, it was found in many cases where undercutting had been performed and the shots fired that the coal simply settled onto the strata below in some cases at least, breaking up but very little. This entailed additional labor for reducing the large blocks to such sizes as could be easily loaded into the mine cars.

It should be noted that the coal puncher closely approaches the results obtained in hand mining and makes practically as much small coal as the latter method. Where the output of the mine goes to coke ovens, it is immaterial, so far as the mining process is concerned, how much slack is produced since it is all ground or pulverized before being coked.

Machines Advance More Regularly

In working coal measures on the longwall system, there are other advantages which may be obtained by the employment of coal-cutting machines; among these might be mentioned more regular working, a more uniform advance of the face and greater safety in working conditions generally. With hand undercutting, the face may be and frequently is, advanced in an irregular manner, while with machine work the whole face advances at the same rate. This leads to economy in the use of timber and safer working conditions generally.

In a considerable number of British collieries, the coal overlies a fireclay, which may be either hard or soft in its consistency. Not infrequently the undercutting is done in this material, and the inconvenience and difficulty encountered because of the soft and yielding floor, may be overcome by mounting the machine on skids rather than wheels. There seems to be a general tendency toward skids, more and more in place of wheels and rails, for although the power required to draw the apparatus along the face is greater, yet the machine itself is more independent and flexible. Furthermore, when employing skids or similar devices, it is not necessary to have the face of the coal either level or straight.

The only locations in Britain where the economy of the coal-cutting machine is questionable are in the collieries mining a particularly soft coal. This is especially true of the mines in South Wales, where the coal is peculiarly soft, and may be cut and brought down with extreme ease. It is here difficult to devise a machine that will show marked economy over hand labor, in spite of the fact that the miners are paid large wages.

In some of the English collieries the method of working is such that the coal face is extremely long. In Yorkshire, in some cases, the working face is 900 yd. in length, there being several such faces in a single colliery. The ideal of one mining engineer who had been largely instrumental in the development of the coal-cutting machines, was a continuous circular face with a number of machines continuously chasing each other, so to speak, around it, the machines being spaced a sufficient distance apart to allow the coal which was cut each night to be loaded out during the next day. In Scotland, the practice, in some collieries at least, is to have a working face about 100 yd. in length, which is cut across during each cutting shift and the coal loaded out during the following haulage shift, the same as in Yorkshire.

Mines of the Continental Coal Corporation

SYNOPSIS—The Continental Coal Corporation, having acquired 16 independent mines, is about to operate them all from a central station.

The Continental Coal Corporation was formed through the consolidation of nearly a dozen different companies, operating 18 different mines in southeastern Kentucky and mining a high quality of coal. The work of uniting the operations of the mines has not been completed, but it is intended to effect economies in operation through central power houses, etc.

The holdings of the companies reach a total of about 35,000 acres in Bell County, eastward and northward from Pineville, Ky. They are situated along the Cumberland Valley division of the main line of the Louisville & Nashville R.R., which serves the mines through its various branches. Eastward from Pineville, up Straight Creek and its forks, are nine mines, named Geraldine, Glendon, Arjay, Cory Nos. 1, 2 and 3, Castro and Barker Nos. 2 and 3. A mile down the Cumberland River, northwest from Pineville at Wallsend, are two mines, Nos. 1 and 3. Three miles farther down the river, and up Four-Mile creek, are seven mines, known as Black Raven, Rim Nos. 1, 3 and 4, No. 5, Black Bear and Cub. Of a total of 18 separate mines, some are so located as to permit one tipple to handle the coal from two or three openings. The duplication of mine numbers is due to the separate ownership preceding the consolidation.

All but two of the mines are working the Straight Creek bed of coal, which is of a high quality. Mines Nos. 4 and 5 on Four-Mile creek work the Rim or Hickory seam, lying about 90 to 100 ft. above the Straight Creek bed at this point. There are numerous other available seams higher in the hills as well as below drainage.

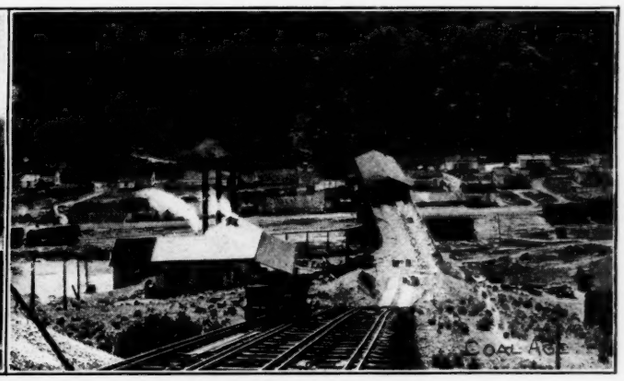
The Straight Creek coal is a free-burning bituminous suited for steam, gas and domestic uses. An analysis made by the United States Navy Department gave the following results:

Carbon	63.40
Volatile matter	33.17
Moisture	2.23
Ash	1.20
Total	100.00
Sulphur	0.68
B.t.u. per lb. dry	15,103

The company has introduced many forms of social betterment. A thoroughly equipped hospital is maintained in Pineville and five physicians are in the service of the company at the several groups of mines. First-aid corps are maintained, one of the crews winning the first-prize

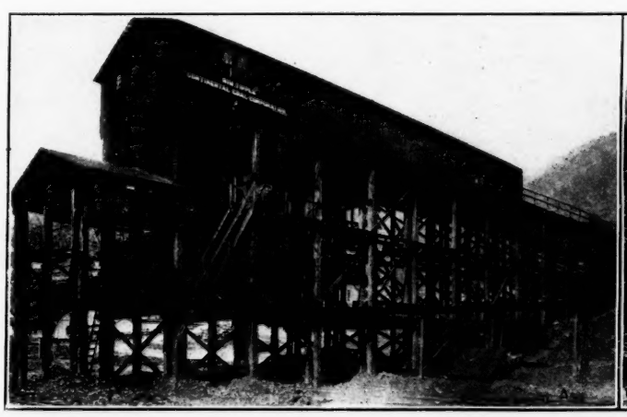
RIM NO. 4, BELL COUNTY, KY.

(This mine, having an output of about 1000 tons a day, is in the Four Mile Creek district, and is one of the two mines working the High Rim or Hickory seam.)



INCLINE AT RIM NO. 4

(The cars passing down this slope are restrained by a barney. The coal thus lowered is dumped to supply the locomotives of the Louisville and Nashville R.R.)



TIPPLE AT RIM NO. 4

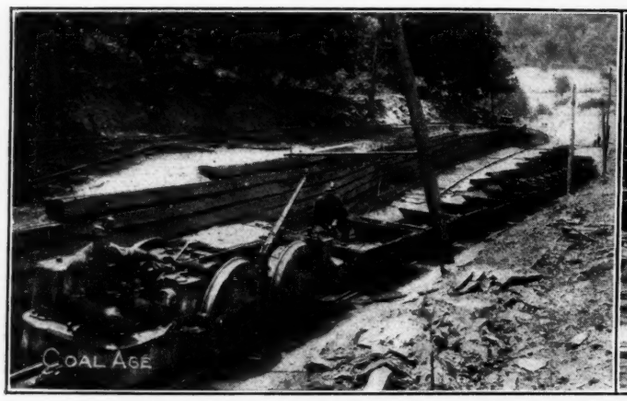
(One of the big tipples of the Continental Coal Corporation.)

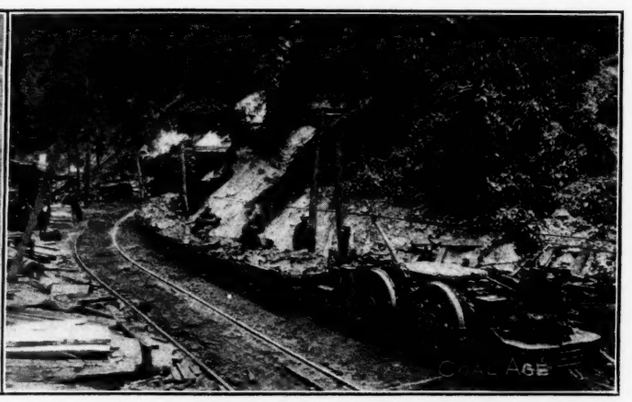
TIPPLE AT ARJAY, KY.

(A less pretentious tipple of the same company.)

trophy at the meeting of the Kentucky Mining Institute in May of the present year. At each of the camps there are baseball and basketball teams which are the champion organizations of southeastern Kentucky.

The height of coal that is being mined varies from 5½ ft., as at the Rim No. 4 mine, where the Rim seam

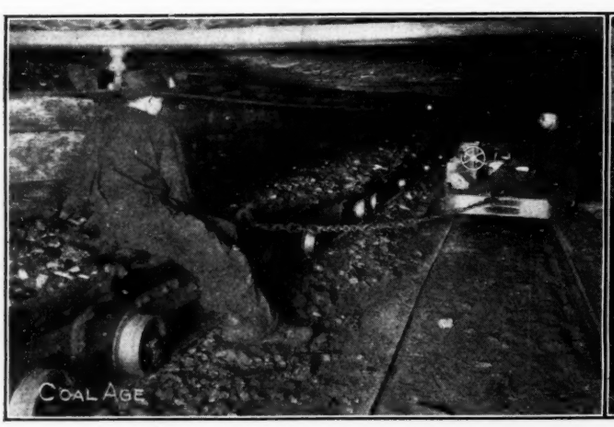




TWO EXTERIOR VIEWS OF THE BARKER MINE

(The grade at Barker favors the loaded cars. Nevertheless it is not customary to let the locomotive follow the wagons out of the mine. Instead it takes the lead and crosses over by the connection shown, and is attached to the front end of the empty trip.)

(Hauling a trip of loaded cars from No. 2 opening of the Barker mine by a 10-ton Goodman, single-motor, electric locomotive. The distance from the tipple to the mine opening is about a quarter of a mile. The cars are gathered inside by a 6-ton locomotive.)



TWO INTERIOR VIEWS AT THE WALLSEND MINE

(A low-type Goodman locomotive chaining loaded cars to the end of a rope-haulage system. The cars in the rooms are pushed both ways by the miners and trips are gathered on the entries by a 5-ton locomotive.)

(A Goodman shortwall machine entering a low room. These machines stand 25¼ in. above the rails. Consequently they can enter rooms only 30 in. high on tracks laid on the floor. No rock is taken down in the rooms.)

is being worked, to 30 in. in the Wallsend mine, working the Straight Creek bed. The coal is all machine mined, being undercut by shortwall machines.

Illinois' Eight-Million-Dollar Coke Production

The production of coke in Illinois in 1912, amounted to 1,764,944 short tons, valued at $8,069,903, against 1,61),212 tons, valued at $6,390,251 in 1911, acording to E. W. Parker of the U. S. Geological Survey. The average value per ton advanced from $3.97 to $4.57. In spite of the increase in production Illinois dropped from fourth to fifth place in rank among the states, because of the much larger increase in Indiana that followed the putting in blast of the entire plant of 560 koppers ovens of the United States Steel Corporation at Gary, which advanced that state from sixth to third place.

All the coke produced in Illinois in 1911 and 1912 was made in byproduct ovens, much of the coal being drawn from West Virginia mines. No bee-hive coke was produced in the state. In some of the ovens the charge consists of a mixture of West Virginia and Illinois coal in the proportions of 4 to 1. This has been found to make an entirely satisfactory coke.

There were four retort plants with a total of 568 ovens in operation in 1912. One of these plants consisted of 240 Semet-Solvay ovens operated by the By-product Coke Corporation at South Chicago. This plant has been enlarged three times, the latest addition of 40 ovens being completed in 1912. Thirteen of the same kind of ovens were operated by the North Shore Gas Co., at Waukegan, having been completed in 1912. These ovens are heated by producer gas made from the coke.

A plant of 280 koppers ovens was operated by the Illinois Steel Co., at Joliet, built in 1908 and 1909, and another of 35 by the Coal Products Manufacturing Co., also at Joliet, completed in 1912. The surplus gas from the former is used at the steel plant.

Nonfatal Injuries in Bituminous Mines

By F. L. Hoffman*

SYNOPSIS—The nonfatal-accident rate in bituminous mines is almost equal to that in anthracite workings. The conjugal relations of the injured are closely the same in both fields and the main differentiation between the regions is to be found in the fact that the percentage of injuries to the head and arms is greater in the anthracite region. In the bituminous field the workers receive a larger percentage of injuries to the body and lower limbs.

In Coal Age of May 31, 1913, I had occasion to discuss at some length the nature of nonfatal injuries in anthracite mines. To make the study complete and to provide the required data for comparison I have brought together the corresponding information for the bituminous coal mines of Pennsylvania, also for the period 1907-1911. There were, in the aggregate, 5602 nonfatal accidents, or 6.04 per 1000 men employed. The inside nonfatal accident rate was 7.22, and the outside rate, 0.42 per thousand. These rates require only to be stated to emphasize the incompleteness of the returns, which are obviously limited only to the more serious casualties.

The same conclusion applies to the anthracite statistics, for, as shown in the article to which reference has just been made, the nonfatal-accident rate for the anthracite region was 6.71 per 1000. Whether the risk is really less in the bituminous region is a matter of conjecture, for there are no means by which it is possible to determine whether the returns are more complete for the one coal field than for the other. In view of the ever-increasing agitation for adequate workmen's compensation laws it is, however, of the utmost importance that all accidents causing disablement for work should be reported, so that a complete statement of the facts may be available and may properly guide those charged with the responsibility for framing more or less far-reaching statutory requirements. Table I exhibits in a convenient form the nonfatal accidents in Pennsylvania bituminous coal mines for the period 1907-1911, together with the comparative rates for anthracite mines, discussed in my previous article.

TABLE I. NONFATAL ACCIDENTS IN PENNSYLVANIA COAL MINES, 1907-1911

	Bituminous		Rate per 1000	Anthracite		Rate per 1000
Year	Employees	Accidents	employed	Employees	Accidents	employed
1907.....	183,121	1207	6.59	168,774	1369	8.11
1908.....	181,840	1026	5.64	174,503	1170	6.70
1909.....	185,921	1126	6.06	171,195	1034	6.04
1910.....	193,488	1142	5.90	168,175	1048	6.23
1911.....	182,653	1101	6.03	173,338	1124	6.48
Total....	927,023	5602	6.04	855,985	5745	6.71

Liability to Accident as Affected by Age

Table II exhibits the age distribution of the injured as determined by means of a special analysis of the facts reported in detail in the returns to the Department of Mines, and for purpose of comparison I also add the corresponding percentages for the anthracite mines.

According to this comparison the age distribution of the injured was about the same in both mining districts, for if the age periods are combined in more convenient form it appears that at ages under 25 the proportion of injured was 30.4 per cent. for the bituminous region, against 32.1 per cent. for the anthracite, whereas at ages 50 and over, the proportion was 7.6 per cent. for the bituminous, against 8.6 per cent. for the anthracite. In other words, the proportion was slightly higher for the two extremes of life in the anthracite region, but the differences are not of sufficient importance to indicate material variations in the accident liability of anthracite and bituminous mining as affected by the ages of the employees. It is a matter of regret, however, that the corresponding age distribution of the employed should not be available for the correct calculation of casualty rates, by divisional periods of life, but even under the present limitations the foregoing table is of much interest and some practical utility.

TABLE II. AGE DISTRIBUTION OF PERSONS INJURED IN NONFATAL ACCIDENTS IN PENNSYLVANIA COAL MINES, 1907-1911

	Bituminous		Anthracite	
Ages	Number Injured	Per cent. of Total	Number Injured	Per cent. of Total
Under 15	18	0.3	18	0.3
15—19	580	10.4	825	14.4
20—24	1104	19.7	1000	17.4
25—29	1158	20.7	949	16.5
30—34	824	14.7	809	14.1
35—39	688	12.3	686	11.9
40—44	462	8.2	543	9.5
45—49	335	6.0	418	7.3
50—54	228	4.1	251	4.4
55—59	119	2.1	135	2.3
60—64	50	0.9	60	1.0
65 and over	29	0.5	49	0.9
Unknown	7	0.1	2	0.0
All Ages	5602	100.0	5745	100.0

Slavonians Lead List of Foreign Born Injured Nonfatally

Table III exhibits the nativities of those injured in bituminous coal mining, together with the corresponding percentages for the anthracite coal field.

This comparison is quite instructive and makes clear the wide difference between the nativities of the mining populations in the two coal regions. It is shown that the proportion of Americans injured was about the same, but that the predominating foreign nativities appearing in the accident returns of the bituminous coal regions

TABLE III. NATIVITY OF PERSONS INJURED IN NONFATAL ACCIDENTS IN PENNSYLVANIA COAL MINES, 1907-1911

	Bituminous		Anthracite	
Nativity	Number Injured	Per cent. of Total	Number Injured	Per cent. of Total
American	1307	23.3	1530	26.6
Austrian	301	5.4	161	2.8
Belgian	21	0.4	0	0.0
Bohemian	37	0.7	2	0.0
Bulgarian	7	0.1	0	0.0
English	192	3.4	157	2.7
Finnish	25	0.5	7	0.1
French	45	0.8	6	0.1
German	175	3.1	147	2.6
Greek	12	0.2	12	0.2
Horvat (Croatian)	45	0.8	3	0.1
Hungarian	363	6.5	144	2.5
Irish	96	1.7	308	5.4
Italian	790	14.1	391	6.8
Lithuanian	119	2.1	529	9.2
Polish	629	11.2	1442	25.1
Russian	179	3.2	261	4.5
Scotch	87	1.6	19	0.3
Slavonian	1066	19.0	379	6.6
Swedish	55	1.0	11	0.2
Syrian	1	0.0	3	0.1
Tyrolean	1	0.0	18	0.3
Welsh	35	0.6	209	3.6
All others	14	0.2	6	0.1
Total	5602	100.0	5745	100.0

*Statistician, Prudential Insurance Co. of America, Newark, N. J.

were: Slavonians, Italians, Poles, Hungarians and Austrians, in the order named, and in the anthracite region: Poles, Lithuanians, Italians, Slavonians, Irish and Scotch. In the bituminous region the proportion of accidents which occurred to men born in countries where English is spoken was 30.7 per cent., against 38.7 per cent. in the anthracite mines.

It is impossible to state what percentage of the men of any nativity received nonfatal injuries since the miners having any given nativity have not been separately enumerated. If it were feasible to calculate precise death rates by nativity much valuable information would be gained regarding the greater or lesser accident liability of some foreign elements than of others. Some have possibly a better aptitude for underground work or a longer mine experience, which, it may safely be assumed, counts for much, although accidents are likely to occur even in the case of the most careful men with many years of underground experience.

The Accidents of Married Men Roughly Equal in Number Those of the Unmarried

The statistics of injured mine employees differentiate only the married and single, and do not mention the widowers, although it would be of considerable importance to have this fact stated, since in workmen's compensation legislation the awards are made to depend more or less upon the number, and degree of dependence, of surviving members of the family. It is, however, extremely suggestive that even according to the present crude nonfatal-accident statistics in Pennsylvania coal mines the conjugal condition of the injured should be shown to be almost the same. The proportion of injured married employees, for illustration, in the bituminous coal mines of Pennsylvania was 55.5 per cent., against 56.1 per cent. for the anthracite region. Recalling that much the same result was obtained in the analysis of the age distribution of injured employees, the conclusion would seem warranted that there are probably no pronounced differences in the method of reporting nonfatal accidents, for, in both mining sections only the more serious casualties appear to be recorded.

The causes of injuries have been classified in reasonable detail in the table which follows, and the minor occupations have been grouped on account of the required limitation of space. As pointed out in the previous article, for scientific purposes, reference to the occupations in detail would be useful, but the value of the analysis diminishes with the decreasing numbers yielded by a minute classification, which can only be made to advantage for a much longer period of time or upon the basis of much more complete returns than are at present available.

For a full understanding of the accident problem in bituminous mines it is necessary to take into account the relation of particular occupations to the prevailing causes of accidents, as quite fully set forth in Table IV, which also shows the percentage distribution of such causes for inside and outside employees combined.

Table IV is self-explanatory and requires no extended discussion. It is shown that the most common causes of accidents in bituminous mines were falls of slate or roof, accounting for 37.5 per cent. of the total, followed by mine cars, accounting for 29.1 per cent., and accidents due to falls of coal, responsible for 16.4 per cent. of the nonfatal injuries from all causes. These three principal groups of causes, therefore, accounted for 83 per cent. of the nonfatal accidents from all causes.

TABLE IV. CAUSES OF NONFATAL ACCIDENTS IN THE BITUMINOUS COAL MINES OF PENNSYLVANIA, 1907–1911

Inside employees	Fall of coal	Fall of rock or slate	Falls into shafts	Mine cars	Explosions of: gas or dust	Explosions of: powder	Explosions of: blasts	Explosions of: boilers	Machinery	Electricity	Horses or mules	Timber	Miscellaneous	Total
Mine foremen	1	7	2	15	3	2	0	0	6	4	1	1	3	45
Asst. mine foremen	0	6	0	1	2	0	0	0	0	0	0	0	0	9
Firebosses	0	4	0	3	4	1	1	0	0	0	0	0	2	15
Miners	686	1331	3	442	44	108	92	0	19	7	12	30	74	2854
Machine runners	24	36	0	22	2	0	2	0	39	2	8	0	3	138
Machine loaders	150	552	6	184	15	18	29	3	15	4	3	4	33	1016
Machine scrapers	34	22	2	11	1	3	0	4	13	2	3	0	2	97
Drivers and runners	10	47	11	715	2	5	0	1	18	30	50	1	41	931
Doorboys and helpers	1	2	0	47	0	1	0	0	3	4	1	0	3	62
Company men	7	64	7	104	10	1	1	0	10	4	2	4	21	235
Other inside	5	21	5	52	4	5	7	2	3	4	4	0	17	132
Total	918	2095	42	1596	87	144	132	10	126	61	84	40	199	5534
Outside employees														
Superintendents	0	1	0	3	0	0	0	0	0	1	0	0	0	5
Foremen	0	0	0	0	0	0	0	0	1	0	0	0	1	2
Blacksmiths and carpenters	0	0	2	5	0	0	0	0	4	0	1	0	2	14
Engineers and firemen	0	1	2	6	0	0	0	1	6	1	0	0	4	21
Coke employees	0	0	0	3	0	0	0	0	0	0	1	0	0	4
Bookkeepers, etc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other outside	0	0	2	16	1	0	0	0	1	0	0	0	2	22
Total	0	2	6	33	1	0	0	1	12	2	2	0	9	68
Grand total	918	2097	48	1629	88	144	132	11	138	63	86	40	208	5602
Per cent	16.4	37.5	0.8	29.1	1.6	2.6	2.3	0.2	2.5	1.1	1.5	0.7	3.7	100.0

The next and most important table of the present discussion (Table V) exhibits in considerable detail the parts of the body injured in nonfatal accidents in the bituminous mines of Pennsylvania. The table conforms in its arrangement to the corresponding table for nonfatal accidents in anthracite mines as published in the article to which reference has previously been made. This analysis, as far as known, is the first contribution of its kind to a more scientific study of the accident problem in mining, and the table is deserving of the most careful study on the part of mine managers, mine physicians, and all others interested in the safety and comfort of mine employees.

The table emphasizes the great importance of thoroughly equipped departments of first aid to the injured, although as previously pointed out, a large number of the minor nonfatal accidents are unquestionably not reported at the present time. The proportion of unspecified injuries in the case of bituminous mines was only 3.2 per cent., against 7.5 per cent. for the anthracite region, and the proportion of multiple injuries combined and not available for tabular analysis was also less in the bituminous than in the anthracite, or, respectively, 4.1 per cent. against 6.5 per cent. In time, as mine man-

TABLE V. PARTS OF THE BODY INJURED IN NONFATAL ACCIDENTS IN THE BITUMINOUS MINES OF PENNSYLVANIA, 1907–1911

Occupation	Employees	Head	Face	Eye	Nose	Shoulder	Eye and other	Nose and other	Shoulder and other	Arm	Wrist	Arms	Feet and other	Wrist and other	Hip	Hips and other	Hand	Hands and other	Finger	Fingers and other	Rib	Ribs and other	Collarbone	Rib	Ribs	Trunk	Hip	Arm and other	Hips	Leg	Legs	Knee	Knees	Ankle	Ankles	Foot	Feet
Inside employees																																					
Mine foremen	6,048	2	0	0	0	0	0	0	1	2	0	0	1	0	0	0	1	0	0	2	0	0	0	0	0	3	1	0	0	12	0	0	0	1	4	0
Asst. mine foremen	1,313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Fire bosses	4,434	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0	2	0	0	1	0	0	0
Miners	358,802	94	42	20	5	44	1	99	0	31	1	0	11	1	0	0	6	42	22	140	13	74	205	50	35	979	23	82	0	110	22	0	0	110	10	22
Machine runners	21,368	5	2	1	1	0	5	0	31	7	1	0	8	2	0	0	2	5	3	19	3	2	10	1	1	51	3	6	0	0	0	0	0	0	67	2
Machine loaders	221,512	29	7	4	1	11	1	34	0	2	0	0	2	0	0	0	2	12	6	45	5	10	111	27	3	393	13	37	0	0	0	0	0	0	8	0
Machine scrapers	20,215	0	1	0	0	1	1	3	0	1	0	0	1	0	0	0	1	3	0	3	0	5	7	1	2	23	0	1	0	0	0	0	0	0	93	0
Drivers and runners	50,382	37	8	0	3	8	0	4	4	63	1	1	19	0	0	0	27	3	14	15	45	4	67	8	13	223	10	29	1	0	0	0	0	0	7	0
Doorboys and helpers	9,603	2	0	1	0	1	0	4	0	4	1	0	2	0	0	0	0	0	3	2	0	0	2	2	2	25	0	1	0	0	0	0	1	0	11	0
Company men	50,484	16	0	0	1	1	1	21	0	21	0	2	5	0	0	0	6	6	4	11	2	2	13	6	2	65	4	9	1	0	0	0	1	0	6	1
Other inside employees	22,127	4	0	0	1	3	3	6	0	6	0	0	6	0	0	0	0	4	4	2	1	3	3	2	4	37	4	1	0	0	0	0	0	0	6	0
Total	766,788	189	62	25	7	11	69	12	242	4	39	1	87	13	86	57	223	27	113	513	93	68	1887	57	42	2	166	3	316	27
Outside employees																																				
Superintendents	3,760	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0
Foremen	2,802	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Blacksmiths and carpenters	13,265	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	2	0	0	0	7	0	0	0	0	1	0
Engineers and firemen	16,783	1	0	0	0	2	0	2	0	2	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	1	0
Coke employees	56,295	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Bookkeepers and clerks	5,375	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Other outside employees	61,946	4	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0
Total	160,235	7	0	1	0	4	0	3	0	2	0	0	2	0	0	0	0	3	1	0	1	0	4	1	0	16	0	1	0	0	1	0	1	0	8	0
Grand total	927,023	196	62	27	7	73	1	245	4	31	1	0	89	3	89	58	225	28	119	520	99	66	1903	57	43	2	166	4	324	27
Percentage		3.5	1.1	0.5	0.1	0.2	1.3	4.4	0.1	0.6	0.0	1.6	0.2	1.6	1.0	4.0	0.5	2.1	9.3	1.8	1.2	34.0	1.0	0.8	0	3.0	0.1	5.8	0.5

Inside employees	Toe	Toes	Internal	Not Specified	Leg and other	Legs and other	Foot and other	Hip and other	Hand and other	Hands and other	Finger and other	Fingers and other	Rib and other	Ribs and other	Collarbone	Arm and other	Arms and other	Leg and other	Face and other	Head and other	Other combinations	Total	Rate per 1000 employed
Mine foremen	1	1	0	3	0	0	2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	45	7.4
Asst. mine foremen	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	9	5.0
Firebosses	0	0	0	0	1	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	15	3.4
Miners	12	12	32	97	4	90	14	3	12	14	9	4	19	9	0	11	9	26	53	15	140	2854	8.0
Machine runners	1	1	3	2	0	2	1	0	0	0	0	0	0	0	0	0	1	1	2	0	8	138	6.5
Machine loaders	6	11	9	32	0	34	3	0	5	11	0	0	4	0	0	0	0	0	0	0	38	1016	4.6
Machine scrapers	3	4	3	5	2	1	0	0	1	3	0	0	1	0	0	0	1	0	0	0	6	97	4.8
Drivers and runners	11	12	12	14	0	10	2	0	1	1	0	0	2	0	0	0	1	4	4	1	28	931	18.5
Doorboys and helpers	0	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	62	6.5
Company men	1	0	5	16	1	4	1	2	1	0	0	0	2	0	0	0	0	0	6	5	6	235	4.7
Other inside employees	2	1	2	5	0	2	0	0	0	1	0	0	1	0	0	0	2	0	1	0	3	132	6.0
Total	37	40	67	177	9	144	16	22	7	20	10	21	39	14	34	12	5	27	13	33	84	21	229	5534	7.2
Outside employees																									
Superintendents	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1.3
Foremen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0.7
Blacksmiths and carpenters	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1.1
Engineers and firemen	0	0	0	0	0	1	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	21	1.3
Coke employees	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.1
Bookkeepers and clerks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other outside employees	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	22	0.4
Total	0	1	0	1	0	1	0	0	0	0	0	0	3	0	0	2	0	2	0	0	0	0	0	68	0.4
Grand total	37	41	67	178	9	145	16	22	7	20	10	22	42	14	34	14	5	29	13	33	84	21	229	5602	6.0
Percentage	0.7	0.7	1.2	3.2	0.2	2.6	0.3	0.4	0.1	0.4	0.2	0.4	0.7	0.2	0.6	0.2	0.1	0.5	0.2	0.6	1.5	0.4	4.1	100.0	

agers, physicians and inspectors realize the importance of accuracy and completeness of accident reports, the number of ill-defined or incomplete returns will naturally diminish. In this respect, however, the returns for the bituminous region are apparently much more satisfactory than the statistics of the anthracite coal field.

The Percentage of Injuries of the Head and Arms to Injuries of the Whole Body Is Lower in Bituminous Than in Anthracite Mining

The information contained in the preceding table is summarized in a more convenient form in Table VI, which follows, and which, for purposes of comparison, includes the corresponding percentage distribution of injured parts for the anthracite region.

This comparison is particularly suggestive and an important contribution to the scientific study of the mine-accident problem of Pennsylvania. Although the nonfatal-injury rates are about the same, or, as stated at the outset, 6.04 for the bituminous, and 6.71 per 1000 for the anthracite region, the nature of the injuries differs materially, or, as shown by the table, in the bituminous region 7.6 per cent. of all the accidents are injuries to the head, face, eyes and nose, against 12.1 per cent. for the anthracite region; and 13.2 per cent. of the injuries are to the shoulders,

arms, rwists, hands and fingers, in the bituminous region, against 21.1 per cent. in the anthracite. In marked contrast, injuries to the collar bone, ribs, trunk and internal parts of the body are much more frequent in the bituminous region, accounting for 18.6 per cent. of the total injuries, against 11.3 per cent. for the anthracite mines.

Injuries to the lower extremities are also more common in the bituminous region, accounting, respectively, for 53.4 per cent. of the total, against 41.5 per cent. for the anthracite. An element of error, however, underlies these figures on account of the larger proportion of ill-defined and unclassified injuries in the anthracite region, or, respectively, 14 per cent., against only 7.3 per cent. for the bituminous.

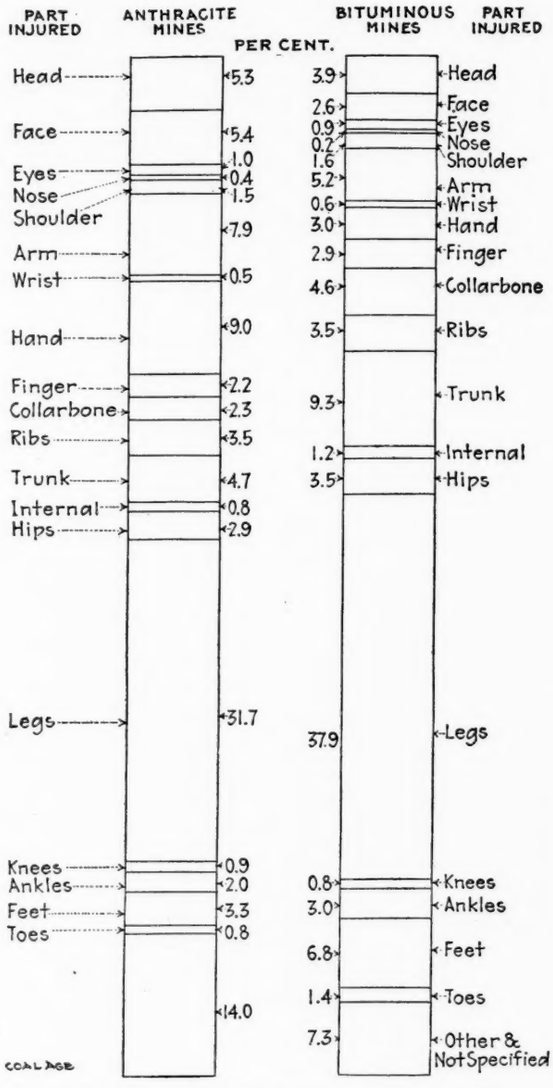
Cost of Compensation

It does not fall within the limits of the present discussion to apply the preceding analysis to the concrete problem of workmen's compensation, and the question of aggregate expense which would fall upon the mining industry if all of these injuries were paid for in conformity to a specific and scientific schedule. We should take into consideration that, in all probability, a considerable number of nonserious injuries in the mining industry are not reported at the present time, but a large number of such casualties would at once become a matter of official record and require compensation in the event of the adoption of a liberal workmen's compensation statute for the benefit of those employed in the anthracite- and bituminous-mining industries.

As pointed out in the previous article, on the British basis of $24.70 per accident, the aggregate cost of a fairly liberal compensation plan would entail a total expenditure of about three and a half million dollars upon the anthracite-mining industry, and on the basis of the same estimate the corresponding expense to bituminous mining would be $3,855,942. These estimates are based on the assumption that the British nonfatal-accident rates, which are accurately determined as a result of the workmen's compensation law, prevail in the Pennsylvania mining industry, although there are reasons for believing that in actual experience the true rates are probably higher. This conclusion would seem warranted in view of the employment of less experienced labor in Pennsylvania bituminous and anthracite mines, and possibly on account of more dangerous mining methods and the larger proportionate use of coal-cutting machines.

TABLE VI. PARTS OF BODY INJURED IN NONFATAL ACCIDENTS IN PENNSYLVANIA COAL MINES, 1907–1911

Part Injured	Bituminous Number Injured	Bituminous Rate per 1000 Employed	Bituminous Per cent. of Total	Anthracite Number Injured	Anthracite Rate per 1000 Employed	Anthracite Per cent. of Total
Head	217	0.23	3.9	306	0.36	5.3
Face	146	0.16	2.6	308	0.36	5.4
Eyes	52	0.06	0.9	56	0.07	1.0
Nose	11	0.01	0.2	24	0.03	0.4
Total	426	0.46	7.6	694	0.81	12.1
Shoulder	87	0.09	1.5	86	0.10	1.5
Arm	291	0.31	5.2	453	0.53	7.9
Wrist	32	0.03	0.6	28	0.03	0.5
Hand	166	0.18	3.0	519	0.61	9.0
Finger	164	0.18	2.9	129	0.15	2.2
Total	740	0.80	13.2	1215	1.42	21.1
Collarbone	258	0.28	4.6	130	0.15	2.3
Rib	195	0.21	3.5	201	0.23	3.5
Trunk	520	0.56	9.3	270	0.32	4.7
Internal	67	0.07	1.2	47	0.05	0.8
Total	1040	1.12	18.6	648	0.76	11.3
Hip	195	0.21	3.5	164	0.19	2.9
Leg	2121	2.29	37.9	1820	2.13	31.7
Knee	45	0.05	0.8	49	0.06	0.9
Ankle	170	0.18	3.0	115	0.13	2.0
Foot	380	0.41	6.8	188	0.22	3.3
Toe	78	0.08	1.4	47	0.05	0.8
Total	2989	3.22	53.4	2383	2.78	41.5
Other and not specified	407	0.44	7.3	805	0.94	14.0
Grand total	5602	6.04	100.0	5745	6.71	100.0



Relative Frequency of Mining Accidents to Various Parts of the Body

A Canadian Coal Decision

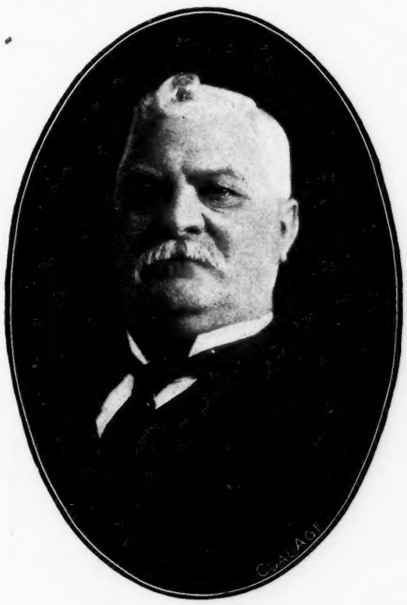
The British Columbia Court of Appeals has given a decision in the litigation between James Dunsmuir and Mackenzie & Mann over the purchase by the latter of the Wellington and other Vancouver Island collieries for $11,000,000.

The court declares Mr. Dunsmuir entitled to all the earnings from the date of the option to the time when the purchase money was paid. Mackenzie & Mann are awarded all the collateral properties, including seagoing craft employed in transporting coal, which, as Dunsmuir claims, were not included in the deal. Both parties are dissatisfied with the decision and an appeal will be taken to the British Privy Council.

Death of a Veteran Inspector

It is with regret that we learned of the recent death of George Harrison, former chief mine inspector of Ohio, which was announced in COAL AGE, July 26, p. 140. Mr. Harrison died Monday night, July 14, after an illness of nearly a year. Early last fall he was stricken with paralysis, from which he failed to recover, and a final stroke has now terminated his life. Mr. Harrison had two strokes of paralysis, previously, the first occurring June, 1910, while attending the Mine Inspectors' Institute Meeting, at Chicago, Ill.; and the second, two years later, when he fell from a street car, at the Union Station, Columbus, Ohio.

Mr. Harrison was born at Greenhead, Northumberland County, England, April 30, 1846. He was compelled to give up school at the early age of seven years, eight months, owing to the protracted illness of his father. As far as he was able, he assisted his mother in the support of the family, which consisted of three sisters and two younger brothers. Because of the growing needs of the family, he was unable to resume his studies and, at the age of 16, moved to Leadgate, County of Durham, where he entered the mines, doing a man's work.



GEORGE HARRISON

A few years later he married and, in 1880, came to this country, leaving a wife and children, five girls and two boys, all under twelve years of age, who joined him after four months. The family located at Byesville, Guernsey County, later going to Wellston, where he was made superintendent of the Wainwright mine. He was an active member of the U. M. W. A., serving for a time as state organizer and, again, as member of the state executive board. He was an energetic worker and a man of unquestioned integrity of character. He has filled every position in the mine from trapper boy to superintendent and mine manager. He was appointed state mine inspector by former Gov. Herrick, May 25, 1904, serving for two terms, consecutively, extending to Aug. 5, 1912.

Mr. Harrison was a charter member of the Mine Inspectors' Institute, U. S. A., and served as president of that institute, from its organization, June, 1908, to June, 1911. Last February, Mr. Harrison moved from Columbus to Caldwell. He is survived by a widow and nine children, two sons and seven daughters, six of the latter being married. Mr. Harrison's service as chief mine inspector will cause him to be remembered long in the state.

The Employees' Magazine

The first number of the magazine published by the Lehigh Valley Coal Co., for the use of its employees, has just been issued. Its purpose, scope and policy are outlined in the foreword, which reads as follows:

"A man is known by the company he keeps."

Likewise a company is known by the men it keeps.

In 1910, when this company established its mining schools, the object was to give its employees an opportunity to secure an education that would better them for their work. This venture, we are pleased to say, has proven a success. Through these schools, however, we have been able to benefit only a portion of our employees, and even for them our efforts along educational lines ceased after they graduated. This limitation pointed to the necessity of a medium that would help all the men all the time; and an employees' magazine, we believe, would best fill that need.

The purpose of such a magazine, then, will be: to acquaint you with uptodate and efficient mining methods; to put you in touch with improvements in machinery, equipment, apparatus, modern construction, operation, etc.; to assist you in avoiding accidents and conserving life and property; and to enable you to exchange your ideas, suggestions and experiences, in order to better your conditions in every possible way. The only discussions that will not be allowed in this magazine are those on matters which are already provided for in agreements between employers and employees in the anthracite coal region. In presenting this first number to you, we trust that you will receive it as cheerfully as it is given, and that you will not only utilize it to your best advantage, but also lend it your aid and support.

THE LEHIGH VALLEY COAL CO.

The new magazine has an attractive cover design in two colors, in the center of which appears the clasped hands of labor and capital outlined against a car of coal. That the publishers hope and desire that there will be such a mutual friendship and understanding is evidenced not only by the whole tenor of its contents, but by the fact that this magazine is published entirely at the expense of the company for free distribution among its employees.

The leading article is by F. H. Gonsolus, manager of the technical division of the duPont Powder Co., of Wilmington, Del., and treats of the proper method of handling and firing explosives. The article is illustrated with half-tones and diagrams; in fact, the whole magazine is handsomely illustrated throughout.

Descriptions of new devices, technical articles which are not too hard for the average mine worker to comprehend, an account of the closing exercises of the Lehigh Valley mine schools, including the record of colliery advancement of over 70 men, as a result of their studies, interesting news items from the various divisions, articles on first-aid work and answers to inquiries take up the bulk of the space, but the publication is not too solemn to publish some good jokes and a page for women, which will appeal to the mine workers' wives.

One interesting news item tells of an innovation which is spreading among the Lehigh Valley collieries. Instead of stopping work on the day of a funeral, as heretofore, the employees send a committee to the ceremony and on the following pay day take up a collection, to which the company contributes $100, for the benefit of the family.

Keen interest has been aroused among the collieries by the publication of the Annual Report of the Inspector of Equipment on the condition of all the collieries and on the ratings of the "Fire Squads" at each colliery. The place of honor this year is held by the Mineral Spring colliery of the Wyoming division with a mark of over 97 per cent.

POWER DEPARTMENT

The Carbon Coal Co's. Central Station

By W. Ewart James* and George W. Hall

SYNOPSIS—A brief history is here given of the inception of the Carbon Coal Co. and a description of its electrical equipment and recently constructed central power plant, together with operating costs and data.

The growth of the Carbon Coal Co., Carbon, Kanawha County, W. Va., is intimately linked with the development of that section of the state through the mining and marketing of the rich coal deposits which nestle under the surface of the region. Less than eighteen years ago the surrounding country, through which flows Cabin Creek, was but a dense forest and had furnished a hunting ground for such men as Daniel Boone, the great hunter and Indian fighter. It is said that the creek derived its name from the fact that the renowned scout pitched his "tent" or "cabin" at its mouth, and that this landmark gave the creek the name it still retains.

For some time little was known of the buzz of industrial progress in this locality; and with the exception of a few lumber camps and saw mills which were scattered along the creek and its tributaries, the resources of this remarkable field lay dormant. Coal for a number of years was apparently of no commercial value, and was mined only in a desultory way until the Garrison interests commenced developing some coal lands in the vicinity of Miami in the year 1895. Four years later Messrs. Thomas, Cabell, Dickinson and others formed the Carbon Coal Co., and at the head of the creek on the waters of Trace and Fifteen Mile Forks commenced operations, which from small beginnings have developed into a gigantic corporation, whose workings extend into three counties, Kanawha, Raleigh and Fayette.

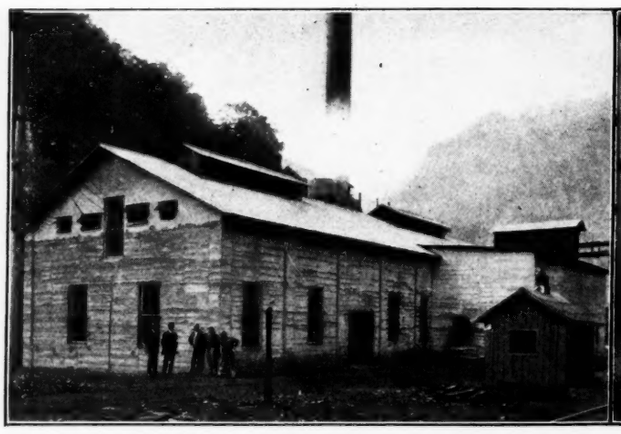
*Chief engineer, Carbon Coal Co., Carbon, W. Va.

The following year these pioneers extended the railroad from Leewood to South Carbon. At the same time Mr. A. E. Humphreys and his colleagues of the West Virginia Colliery Co. constructed a similar means of transportation from Decota to the mouth of Coal Fork, and shortly afterward were engaged in extending their track up Long Branch to the No. 4 Mine. The Republic Coal Co. was inaugurated at about this time, and within the next few months had completed a branch line of railroad throughout its entire holdings. During this period of construction, it may be said that the rapid progress of development changed the very atmosphere of the community; instead of remaining the secure haunts of the bear and the deer, it was quickly transformed into a business center.

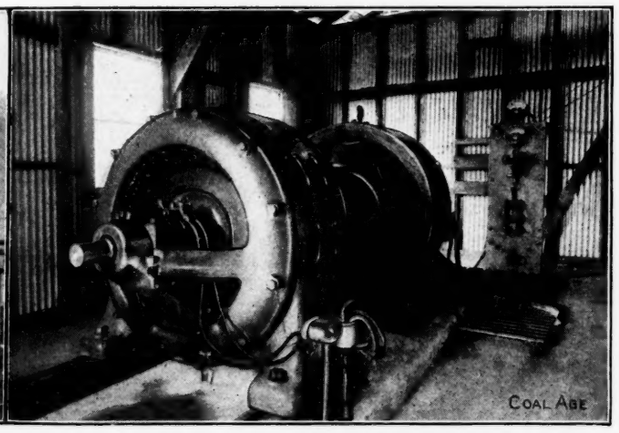
A Gradual Growth

The Carbon Coal Co., with its subsidiaries, the Republic Coal Co., and the West Virginia Colliery Co., has gradually been spreading out in all directions and is constantly looking ahead for new developments. The several companies are operated independently, but are controlled by the same management. Electric power for operating the various collieries was being generated in three separate and distinct power plants, which contained belt-driven generators that had been in use for quite a number of years. New installations were continually being added to these plants as necessity warranted, until each became a complicated arrangement of scattered mechanism; yet it still remained inadequate for the demands. It was therefore deemed expedient to resort to a more modern means of generating the motive power required.

The project of erecting a "central power plant" was carefully worked out; and though it was found by calculation that the initial outlay would inevitably be heavy, it was evident that the ultimate advantages would be overwhelmingly in favor of the proposed new installation.



General View of Power Plant



Motor-Generator Set in No. 1 Substation

It was therefore decided to proceed at once with the work, and Mr. James was authorized to design and superintend the construction.

An absolutely fireproof building, designed not for the conditions of today, but for the requirements of tomorrow, houses the entire plant. It has a structural-steel frame with reinforced-concrete walls and is arranged so that another unit may be installed at any time with no extraordinary expense, the foundations being already set for a complete duplicate of the present installation, boilers included.

The boiler room, with its battery of two 440-hp. Stirling boilers, presents a pleasing appearance and is symmetrical in every detail. The ashes are dropped into a steel car, which operates in a concrete pit beneath the floor, and are transported to the end of the building where the car is elevated and dumped into an ashpit of large capacity. They are afterward hauled away to repair roads, etc., in the vicinity.

The fuel supply is obtained from an adjacent mine and is deposited by means of a conveyor in a car, which runs by gravity over a short trestle and then dumps the coal into a concrete storage bin of sufficient capacity to provide for a two weeks' run. Thus, in case of a breakdown at the mines the power plant will not suffer from lack of fuel.

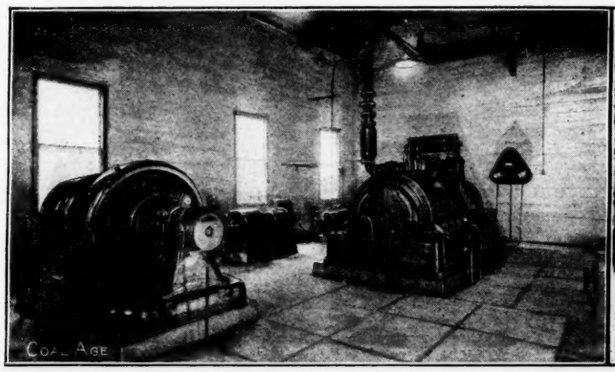
Water for the boilers is obtained from a well sunk 150 ft. deep and operated by a 6x24-in. deep-well pump, which is driven by a 10-hp. electric motor. Before entering the boilers, the water is treated for scale prevention by a process prescribed by C. A. Cabell, general manager of the company. It is then pumped through a 2500-hp. heater, filtered and forced by a hot-water pump into the boilers at a temperature of 90 deg. C. (194 deg. F.). The boilers are equipped for a pressure of 150 lb., and draft is furnished by a circular stack 4 ft. in diameter by 100 ft. high, with damper regulators at the base so as to maintain a uniform heat. Each boiler is fitted with an automatic-feed arrangement, which keeps the water always at a fixed level. Both the hot- and cold-water pumps are 10x6x10-in. direct-acting type.

The Plant Is Strictly Modern

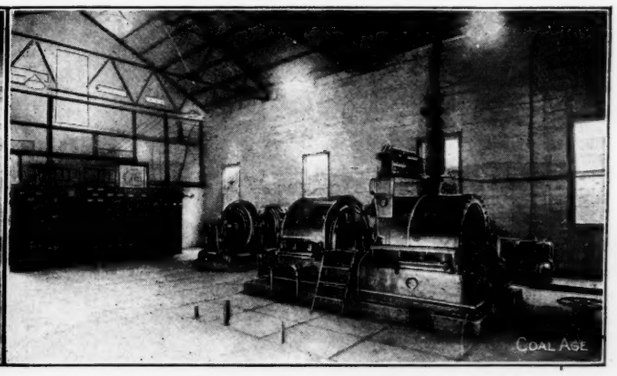
The new central power plant is designed and constructed along the most modern lines, and is equipped with the highest-grade machinery and apparatus. Provision has been made for any emergency that may arise, and the entire plant is worthy of a close inspection by those interested in the electrification of mines. An exceptionally noteworthy feature of the installation is the effective manner in which some of the old apparatus in the former isolated power plants has been utilized in the substations established in connection with the present central station. All the power-house equipment as well as the new substation machines were designed and built by the General Electric Co.

The proposition involved abandoning the three distinct plants, which were operating at a fair cost, and replacing them with a noncondensing turbo-generator central station, which has since been able to reduce this cost to a minimum, making the investment one of good value. The company was confronted with the question of disposing of about $10,000 worth of apparatus by placing it on the second-hand list or in some other manner, and it was a difficult matter at the time to understand wherein discarding this apparatus would warrant the expenditure of some $80,000 for a central power plant.

The problem was partly solved by retaining the old generators for the substations and building them into motor-generator sets by using synchronous and induction motors, operating through flexible coupling drives. There were four of these machines in all, one of which has since been sold to meet an emergency, and has been replaced by a new 150-kw., 600 rpm., 250-275-volt direct-current generator.



Motor-Generator Set and Main Power Unit



The Turbo-Generator and Switchboard

In the power plant is installed a 937-kv-a., 3600-rpm., 2300-volt, alternating, noncondensing, horizontal turbo-generator. Excitation for the unit is furnished by a 15-kw., 4500-rpm., 125-volt, noncondensing turbo-exciter and a two-unit motor-generator exciter set composed of a 25-kw., 1200-rpm., 125-volt generator direct connected to a 35hp. 2200-volt motor. The installation also includes a two-unit motor-generator consisting of a 200-kw., 720-rpm., 275-volt generator direct connected to a 300-hp. 2200-volt motor. A 12-panel switchboard, with the necessary generator and feeder circuits, which are metered by recording wattmeters that measure the power for each circuit, completes the equipment.

Five substations are at present in operation, each being located to suit the requirements of an allotted area, as shown on the annexted property map. They are all of similar design, but the installations vary slightly.

No. 1 substation is located at the Carbon Splint mine, 3200 ft. from the central station, and contains a 150-kw., 600-rpm., 250-volt generator coupled to a 220-hp. 2200-volt synchronous motor.

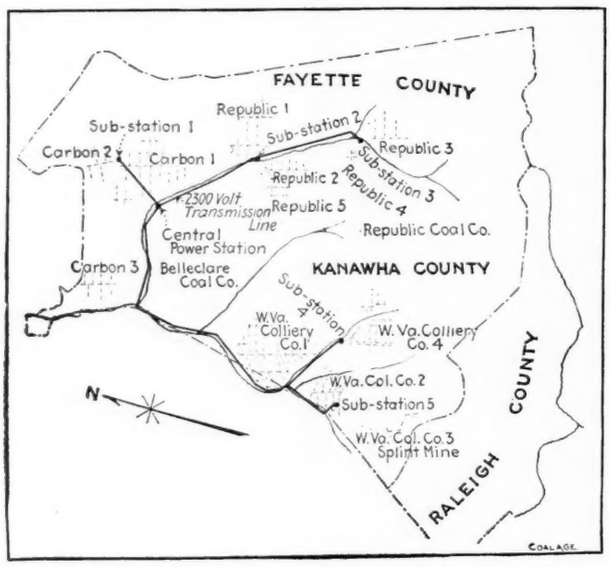
No. 2 substation is situated at Republic No. 2 mine, 6400 ft. from the plant, and its equipment consists of one 150-kw., 250-volt, 600-rpm. generator connected to a 200-hp. 2200-volt induction motor.

No. 3 substation is located at Republic No. 3 mine, 11,200 ft. from the main station, and has apparatus of the same capacity and characteristics as No. 1 substation.

No. 4 substation is situated at the entrance to the West Virginia No. 4 mine, 18,800 ft. from the power plant. It embraces practically the same equipment of apparatus as No. 2 substation.

No. 5 substation is at the mouth of the Gibson Entry of the West Virginia No. 2 mine, 18,400 ft. from the power station, and has precisely the same installation as No. 4 substation.

The various motors and machines which are operated from the substations are tabulated herewith: No. 1 substation—Two 3½-ton gathering locomotives, three 5-ton



PROPERTY MAP OF THE CARBON COAL CO.

gathering locomotives, one 10-ton haulage locomotive, one 25-hp. stationary motor, four breast mining machines.

No. 2 substation—Three 3½-ton gathering locomotives, three 5-ton gathering locomotives, two 6-ton haulage locomotives, six 10-hp. stationary motors, three breast mining machines.

No. 3 substation—Four 3½-ton gathering locomotives, one 6-ton haulage locomotive, one 15-hp. stationary motor, three breast mining machines.

No. 4 substation—Two 5-ton gathering locomotives, two 10-ton haulage locomotives, two 5-hp. stationary motors, one 7½-hp. stationary motor, two 10-hp. stationary motors, one 45-hp. stationary motor, six breast mining machines, and one short-wall mining machine.

No. 5 substation—One 5-ton haulage locomotive, one 6-ton haulage locomotive, one 5-hp. stationary motor, one 7½-hp. stationary motor, two 10-hp. stationary motors, one 25-hp. stationary motor, and four breast mining machines.

Motor-generator set in power house—One 3½-ton gathering locomotive, two 5-ton gathering locomotives, one 6-ton haulage locomotive, one 10-ton haulage locomotive, two 7½-hp. stationary motors, three 10-hp. stationary motors, one 15-hp. stationary motor, two 25-hp. stationary motors, one 45-hp. stationary motor, five breast mining machines.

The most satisfactory way to determine the relative superiority of one plant over another is to compare their merits on a basis of the cost of production in combination with their ultimate efficiency. There are no detailed accurate figures on record regarding the output obtained from the old plants, except that the average per month for the Carbon, Republic and West Virginia power plants combined was approximately 90,000 kw.-hrs. The actual cost of maintenance, including fuel, salaries and all other contingencies, amounted to $1368 per month on an average; thus the cost of production was $0.0152 per kw.-hr.

THE TABULATION OF COSTS

The following table is compiled from the engineer's daily report and gives an accurate account of the amount and cost of power production at the central station from the commencement. It will be noticed that the cost per kw.-hr. for September, October and November was materially enhanced, owing to the recent labor trouble which invaded the coal field; that the power produced was infinitely less than when all the mines were running their full capacity, while the actual cost of maintenance was practically the same. A glance at the record for August discloses the fact that the greater the output the cheaper the power per kw.-hr.:

TABLE OF COSTS

Month	Cost of Fuel, Supplies and All Other Items	Salaries and Labor Cost	Kw.-hr.	Cost per Kw.-hr.
June	$345.95	$317.00	96,768	$0.0068
July	416.50	315.00	108,440	0.0067
August	430.10	310.00	113,700	0.0065
September	282.20	321.00	74,830	0.0080
October	300.90	314.00	57,080	0.0107
November	300.90	312.00	66,330	0.0092
	$2,076.55	$1,889.00	517,148	$0.0079

It will be seen that the actual productive cost for power generated in the new central station averaged $0.0079 per kw.-hr. during the six months' period as against a cost of $0.0152 per kw.-hr. for that generated in the three former isolated plants. Under the old régime the cost of production was slightly over $16,000 per annum. During the first six months of central station operation, practically the same amount of power was consumed as during the corresponding six months previous. Figuring on a basis of 2 cents per kw.-hr. and including ample allowance for depreciation, interest charges and all other essential incidentals, a saving has been effected of $1,221.67 in six months. This saving will more than double itself in the second half-year, since the central-power plant had only just been completed, during the first six months much in excess had been charged to the cost of production which really should have been debited to capital stock.

One important benefit derived in this instance since the introduction of central-station operation, which should not be overlooked, is the improvement in the facilities of the company for proper growth. With the old plants, the power was so inferior and inadequate that new developments were out of the question altogether.

EDITORIALS

To Save Lives

The question of what is a legitimate risk to be taken with the hope of saving lives believed to be in danger, or that may already have been sacrificed, has been raised by the recent remarks of Sir Thomas Holland, before the Indian Mining & Geological Club, at the Mining Machinery Exhibition, in the Royal Agricultural Hall, London. In the course of his remarks, Mr. Holland referred to the tragic death of the late president of the club, W. H. Pickering, who sacrificed his life in the attempt to rescue any possible survivors of the first explosion in the Cadeby Main Colliery, July 9, 1912, in the following words:

Everyone present knows that, but for the great disaster at Cadeby last July, our revered president, in his inimitable way, would now be in this place expressing your appreciation of Mr. Montgomery's hospitality. This is the first general gathering of the club since our president and founder lost his life during what was but the last of a series of heroic acts on behalf of the miner. To those of you who know that the same unflinching regard for duty controlled Mr. Pickering's actions in small as well as in great things, the cold official comment on the Cadeby disaster recently issued by the Chief Inspector of Mines must seem like sacrilege. Allowing for Mr. Redmayne's apparent difficulty in conveying his thoughts in simple English, I have no hesitation in saying that the sentiment conveyed in the last paragraphs of his recent report will be condemned by every healthy-minded miner as unworthy of the traditions of our race.

Putting aside for a moment the moral question as to whether it is right to lead a body of men into an unknown danger to save a probably much smaller number of their fellow-workers, there is good reason for assuming that Mr. Pickering was justified by the facts before him at the time in leading a rescue party. He had with him other men of known experience and good judgment, his official colleagues and the manager of the mine; he was closely followed by another party led by an inspector as experienced as J. R. R. Wilson, who, but for an accidental delay, would, as we now know, have been killed also.

It is easy to be wise after the event; it is easy apparently in the comfort of an office chair to criticise the wisdom of more experienced men; but this report fails most lamentably to distinguish between the conclusions which were justified by the facts before Mr. Pickering and his colleagues at the time, and those which have since been obtained. Even as a cold official judgment, therefore, on the purely professional question of whether it was or was not discreet to go underground, the inferences drawn in this report seem to me to be unscientific and unsound. But the sentiment that it displays is even more to be deplored.

Fancy this country admiring the professional wisdom of Captain Scott if he returned safely rather than expose his men to the dangers of the Antarctic! Fancy Pickering sitting at the surface estimating the distant risks of another explosion while his fellows were dying below! Doubtless if the rescue party had been restrained long enough, in this case as in similar cases, they could have proved the futility of an attempt, as the men would then have been dead. [But, the deeds of men like Pickering and Scott are worth more than lives; through their deaths the spirit of the race lives, for to this world a brave man dying in the face of danger is worth more than ten cowards living and carefully counting the costs.] After reading this report, I see the real wisdom of the Archbishop of York, who said truly of Pickering: "His was not a life cut short, but one abundantly completed and fulfilled." It is our duty to see that the memory of such a man is preserved, for the benefit of our race.

In order to enable the reader to arrive at a fair judgment of this severe arraignment of the chief mine inspector of Great Britain, made recently in an official report to the home office, which has since been issued as a blue book (Cd. 6716), we abstract the following paragraph to which reference has been made:

THE RESCUE OPERATIONS

I have formed a decided opinion in respect of the rescue operations. While there was provided at the colliery as fine a body of men trained in rescue work as one could wish to see, the organization at the mine on the occasion of these explosions was most defective. When Mr. Witty made his arrangements at the surface, he should have issued instructions prohibiting the descent into the mine of all persons unprovided with a written authorization to do so. He should also have placed a guard at the outby end of the south plane to prevent the entry into that district of unauthorized persons from other parts of the mine. Had this been done the loss of life occasioned by the second explosion would, I am sure, have been much less heavy.

The further questions as to whether the work of recovering and bringing out the bodies should have been undertaken at this stage is one in respect of which there will doubtless be differences of opinion. I have no doubt on the point I know that sentiment weighs heavily in the consideration of a problem of this nature, and that there is an intense desire on the part of relatives of the dead to see and bury the bodies I do not think, however, that the management of a colliery is justified in allowing persons to risk their lives in order to recover and bring out dead bodies, for that such a procedure is always attended by the great risk of a second explosion when a fire is known to exist underground after an explosion, is evidenced by case after case. Instances may be cited in which the bodies have been recovered after an explosion of this nature (e.g., Jamage Colliery). I agree, but it is a race with death. It is hard, however, to make people realize this, and so strong may feeling run on these occasions that it sometimes requires a higher moral courage to resist a natural impulse and prohibit persons from undertaking (and undertaking oneself) a risk of this nature, than to allow the risk to be undertaken.

I should also remark that great difficulty was experienced in obtaining a correct number of the casualties; this was not definitely ascertained for three days after the disaster owing to the indiscriminate issue of lamps after the first explosion. This was a regrettable incident, and one which emphasizes the necessity of strict discipline at such times.

I cannot conclude this report without recording my sense of the magnitude of the loss which the Mines Department has sustained in the death of three of its inspectors. Mr. Tickle was a most promising junior inspector, and was, I know, held in high esteem by Mr. Pickering. Mr. Hewitt was a careful and experienced inspector. By Mr. Pickerings's death the country is deprived of one of its most capable and devoted public servants, and I personally have to mourn the loss of a most able colleague and a loyal and valued friend.

We believe it is wise to refrain from further comment on this sad incident. It seems to us both unseemly and unjust to assume, in the light of later developments, to call in question the acts of one who, with a limited knowledge of conditions, was forced to decide, for himself and others, the question of the advisability of taking a risk that meant possible life to others or death to themselves. It was truly, as Mr. Redmayne has expressed it, "a race with death." Who is so wise as to say, with the limited knowledge of conditions available, that a risk taken to save lives is justifiable or otherwise. It is true, sentiment is strong in the human heart, but that sentiment reasons just as strongly for the living as for the dead.

The words of Sir Thomas that, for sake of emphasis, we have placed in brackets appeal to us, as they must to all, very strongly.

Mr. Pickering is no exception among mine inspectors. Many instances have occurred, both in this country and abroad, where these men have sacrificed their lives in the endeavor, as they hoped, to save the lives of others. Two instances that we recall, at this time, are the death of Mine Inspector William Atkinson, who was killed by afterdamp while attempting to rescue victims of the explosion at Zeigler, Ill., Apr. 3, 1905; and the death of David N. Elias, who was killed in the second explosion, which occurred a few hours after the first and which resulted in the sacrifice of 41 lives in addition to the 18 lives lost in the first explosion at Hanna, Wyo., Mar. 28, 1908. Both of these men were experienced miners and men of mature judgment; and we would not say that this was in error. Judgment may differ in individuals, but can only be declared in error when shown to be so, in the light of facts available at the time.

The Passing of the Braggart

We like to think we do not miss the braggart who hauled more cars in the barroom than mule flesh and human endurance could withstand. But we do miss those men, and others like them who, in the past, measured their importance by their ability to produce and who cared less about pay than product.

We hardly realize how we are drifting from the old conditions. The difference between the man who tells how he evades his duties and the man who brags how well he performs them is the difference between unproductiveness and efficiency, between national poverty and national wealth. One-half the prosperity of America is the outcome not of great natural resources but of the large output per man employed. That productivity of labor found its origin in the belief on the part of every man that he was an important part in the community and that his success or failure in his work was a matter of general importance and concern.

The workingman of the past gloried in the fact that he was the man who could be called to do anything "in a pinch," that he was able to fill in almost any gap and always "stayed put." The contest to do better each than the other made the product larger per man employed and the national rewards have been proportional.

If we are going to drift into an existence without enthusiasm, each man striving to do his least and worst, if the coal getter is going to believe that a fortune will accrue to him and his family if he can shoot his market coal to pieces and load worthless coal, slate and pyrite, nothing but the greatness of our unused resources will save the nation from penury and these safeguards will not provide for our present standard of living.

The boaster is a living, laboring workman. We recall a superintendent who said: "I used to think that I could dig coal with any man along the Monongahela River and there were good men in the mines in those days." He admitted he found there were those who could beat him but the sense of his superiority to some and his desire to equal others increased his usefulness.

Today there are too many content to whine that the world owes them a living and we would fain see those fellows return who boasted of their work, who tried to excel and looked at the plant in which they worked as partly their own and not as a revolving wheel of which they were wearied spokes ever hurrying on to perform a work in which they had neither interest nor hope.

In the history of a nation, the era most pregnant with possibilities is that in which it boasts most loudly, and in the career of man, the least reputable period is when he doubts his mission and feels there are others who could and would fill his job to equal advantage.

The Slaughter of the Innocents

With this cheerful reference to the Herodic times, the conservationists would stigmatize child labor. We have already called attention to the fact that to forbear to work is, in most cases to weaken the physical frame, to stunt the mind and to debase the spirit of the race.

But today, we would rather confine ourselves to the question "Is the callow youth, as employed in the mining industry, subject to exceptional risks?" As usual we must look to Great Britain for a statistical answer, for while the public of the United States stresses the memory with the count of the dead few, it keeps no record of the living many. Moreover in many instances those opposed to labor ignore statistics altogether and rely on their intuitions for guidance in their advocacy of laws.

We presume that in Great Britain, the "conservationists of infancy" point with condemnation to the record of the industrially slain—50 children under 15 years of age in 1909 and 55 in 1910—and we venture to think that they suppose as do our "antis" that these might all have been saved had they been kept safely in school. Yet the figures show that per thousand employed only 1.02 were killed in 1909 and 1.07 in 1910. This compares favorably with the death rate of all ages, which for Great Britain was 1.43 in 1909 and 1.70 per thousand in 1910.

The deaths and ratios for all ages are as follows:

DEATH RATES OF BRITISH MINE WORKERS BY AGES

Ages	Deaths 1909	Deaths 1910	Per thousand 1909	Per thousand 1910
12 and under 14	10	12	0.49	0.57
14 and under 15	40	43	1.38	1.44
15 and under 20	257	277	1.60	1.66
20 and under 25	169	245	1.06	1.51
25 and under 35	308	418	1.16	1.53
35 and under 45	302	330	1.69	1.78
45 and under 55	195	249	1.68	2.07
55 and under 65	110	143	1.98	2.49
65 and upwards	27	25	1.74	1.56
Age unstated	6	12	....	....
All ages	1424	1754	1.70	1.43

It is clear that the most risky early period is that between 15 and 20 years, the very time at which our conservationists would have boys enter the mines. Yet even the death rate in this period is not as high as that which rules for men above 35 years of age.

We think that apart from the necessity for keeping the boys at school, there is no reason for holding youths under 16 years of age from the safe occupations usually accorded to such immature mine workers. But if youths are allowed by law to leave the classroom at 14, they may well enter the breaker of the mine at that age and if, perchance, they are compelled by legislative enactment to continue in school, at which we would not cavil, they should be compelled to do some manual work which would prevent them from becoming at once both too weak and too proud to labor.

Particular attention is called to the series of articles, "Coal Shipping on the Great Lakes," the first installment of which appears on p. 186 in this issue.

Renewed Peace on Cabin and Paint Creeks

*SYNOPSIS—**Another** settlement in the Cabin and Paint Creek districts gives some hope of enduring peace. The following statement sent out by the operators gives their point of view of the struggle now thought to be happily terminated.*

By the terms of an agreement signed July 29 by the Cabin Creek Consolidated Coal Co., Carbon Coal Co., Republic Coal Co., West Virginia Colliery Co. and Wake Forest Coal Co. and representatives of their employees and ratified on the night of July 31 at mass meetings of the latter, the so called strike on Cabin and Paint Creeks which has kept the state in a turmoil for sixteen months was brought to an end. An attempt was made to have the agreement ratified at an open-air meeting at Decota, on Cabin Creek, Thursday afternoon, July 31. So little interest was taken in the matter that not more than 450 miners attended the meeting. The men at one mine refused to leave their work to attend. A few Industrial Workers of the World and other disturbers prevented action, so it was necessary to hold a number of similar meetings in the evening. Under normal conditions 3000 men are employed at the mines affected by the agreement.

The Union Is Not Recognized

The principal point scored by the operators is the maintenance of the open shop. Ever since the union declined to arbitrate a disagreement in 1904, the Cabin Creek operators have refused to recognize it and it is not recognized under the newly made agreement. The check-off, the concession most vital to the union, is not granted. The mine committee, which is the union means of adjusting grievances, is also not acknowledged. In its stead a system of appeal from the mine boss to the superintendent and then to three arbitrators, one of whom is to be the president of the local union, is established. It is also stipulated that "under the terms of this contract nothing shall be done or enacted that shall increase the cost of producing coal to the operator."

The price per ton is changed but little, being in some instances reduced and in others advanced. On the whole, the change amounts to an increase of about 1 per cent., but as the short ton replaces the long, which in itself constitutes an increase of 11 per cent., the average rise in the price of mining is increased 12 per cent.

Other concessions gained are the 9-hr. day and the semi-monthly pay day. Still other nominal, but not actual concessions are the right to employ check-weighmen at the miners' expense, a right guaranteed by law and never denied by the operators, and the right of the miner to trade where he pleases, a right which they have freely exercised. Other clauses in the agreement, which terminates April 1, 1915, define in detail ordinary practices to be observed in mining.

An Insurrection Not a Strike

The so called strike on Cabin and Paint Creeks was in reality an armed insurrection, organized, financed and directed by the United Mine Workers of America for the sole purpose of compelling the miners of West Virginia to join the union. It began sixteen months ago. It was fomented by agitators hired by the union, afterwards reinforced by the socialists, and directed exclusively by men from outside the state. Within a few days after Duncan McDonald, secretary-treasurer of the United Mine Workers of Illinois announced at the joint conference of operators and miners of Illinois, Indiana, Ohio and western Pennsylvania that the union was about to "get busy" in West Virginia, the union miners on the opposite side of the Kanawha River from Cabin and Paint Creeks began buying rifles. Not until about a thousand union men had been armed was the strike called at the few union mines on Paint Creek.

A guerrilla warfare was then begun. At one time the union had five thousand men armed with modern high-power rifles, in the field. These were opposed at one time by 145 private guards on the two creeks, and later by the entire military force of the state, amounting to 1200 men.

The Cost of Industrial War

Thirteen lives were lost in the insurrection. The cost in money was as follows: operators' loss in business, $2,000,000; loss to the miners in wages, $1,500,000; cost to the taxpayers of the state, $400,000; additional cost to the taxpayers of Kanawha County, $100,000; cost to the United Mine Workers, collected by the check-off, a forced levy on the miners of Illinois, Indiana, Ohio and western Pennsylvania, $602,000; property destroyed, $10,000; total, $4,612,000. According to the latest available statement in the United Mine Workers *Journal*, the official organ, the union's total membership in the state was increased by this insurrection from 1136 in a total of 69,611 mine workers in the state to 3074. Thus it seems that the cost of union proselytes in West Virginia figures out at $2379 a head.

It is worthy of note that a large proportion of the mine workers on Cabin Creek were so strongly opposed to this method of convincing them of the benefits of unionism that they have remained at work throughout all the series of shootings and other disturbances, so that the mines have never been closed entirely but have been in continuous operation, most of the time at one-half to two-thirds normal capacity. The Cabin Creek operators have not failed to fulfill any contracts and have not canceled any orders for coal. This explains why the loss of business was so light in comparison with the loss in wages.

OUTCROPPINGS

He who abuses others must not be particular about the answers he gets.

If the young knew, if the old man could, there is nothing but would be done.

Judging from the new state tax on anthracite we presume Pennsylvania is preparing to erect another capitol building.

Some operators no doubt think of a "good striker" in the same terms that the Western pioneer thought of a "good" Indian.

The statement that Standard Oil recently paid a fine of half a million dollars in Texas, was a mistake. It simply advanced the money pending collections from the public.

The Value of a Safety Inspector and Instructor for Each Coal Mine

By C. H. Nesbitt*

It is probable that no subject, throughout the industrial world, has received more consideration than that of reducing mine accidents. On this occasion, we come, face to face, to discuss the problem, as it concerns the coal mines of Alabama. Great progress has been made, from time to time, in the mines; and each year we are adding new features and taking new steps, in the direction indicated.

The inauguration of safety inspectors and instructors, in coal mines, is of such importance as to immediately commend itself to all of our coal operators. We all, doubtless, agree that education and supervision are indispensable, in all classes of trade where the best results are to be obtained. All industries that employ labor realize that it is important to have adequate supervision over the entire force, even though life and limb are not at stake. In coal mining, supervision and discipline are difficult because the workmen are segregated, singly or in pairs, in their respective working places; and, unlike in mills, factories and quarries, the foreman or superintendent cannot keep an appreciable number of men under his eye and direction, at the same time, but successive and frequent visits to each working place in the mine are imperative.

A Department of Safety and Instruction

In coal mining, where the hazard is great, the cost of such supervision is many times offset by increased efficiency, which invariably accomplishes a reduction of accidents. I would, therefore, earnestly advocate that the operators of Alabama, each, establish a Department of Safety and Instruction; and that, in addition to the work of the mine foreman and fireboss, daily inspections be made of every working place, by an experienced person, qualified to teach and authorized to enforce provisions for safety.

In this state, in 1912, we recorded 62 fatal accidents at the working face. These accidents were attributable to the following causes, namely: Fall of rock, fall of rock and coal, fall of coal and shotfiring. This constituted over 50 per cent. of the total number of fatalities for that year. Upon investigation it was found that a majority of these fatalities could have been avoided if proper instruction had been given and supervision exercised. Probably, in all cases, the victims of these accidents followed their best judgment, which obviously was bad. It is, therefore, necessary that the advantage of experienced direction and supervision of the work should be given to all operations. No better evidence of the value of such a system could be cited than the results that have been attained by those Alabama operators who have inaugurated the system.

A striking example of the value of safety inspectors and instructors is the accident record of the Frick Coke Co. At all of the numerous mines, a sufficient number of qualified inspectors and instructors are constantly employed. Following is the coal-mine-accident record of the company, for the past three years, as compared with that of the British Isles:

DEATHS PER MILLION TONS PRODUCED

	1910	1911	1912
Scotland	5.06	4.12	3.50
South Wales	5.60	5.67	6.53
All Britain	6.54	4.47	4.52
H. C. Frick Coke Co.	1.99	1.72	1.88

TONS OF COAL PRODUCED PER DEATH

Scotland	197,600	242,000	285,500
South Wales	150,700	176,100	153,000
All Britain	137,100	243,500	248,000
H. C. Frick Coke Co.	502,049	578,151	531,328

DEATHS BY FALLS PER MILLION TONS MINED

Scotland	2.10	1.76	1.86
South Wales	3.18	3.20	2.79
All Britain	2.36	2.33	2.03
H. C. Frick Coke Co.	0.97	0.90	0.70

DEATHS BY CARS PER MILLION TONS MINED

Scotland	0.68	0.84	....
South Wales	1.68	1.47	....
All Britain	1.02	0.98	0.87
H. C. Frick Coke Co.	0.79	0.41	0.91

As long as human muscle and brains are essential to coal mining, just so long will the human element, in the causation of accidents, exist; and the percentage of avoidable accidents will remain directly proportionate to the extent that ignorance, carelessness, indolence, disobedience to rules and instructions, and poor judgment prevail.

Responsibility for Accident

We have tried placing the responsibility for accident upon the individual and have found that it did not accomplish the desired end. As we know, it is a difficult matter to convince the man of poor judgment that he is not as well equipped for his duties as another man of superior judgment; therefore, the man of poor judgment needs and will benefit by the close and constant supervision and instruction which would be obtained by the system I have advocated. It must be hammered into him. While there must of necessity be joint instead of individual responsibility; at the same time, there must always be, as in an effective military organization, some directing head or commander, immediately overlooking the work as it progresses, and intelligently managing the details, along the line of safety.

Doubtless, some operators will object to the inauguration of such a system, because of the expense entailed by the increased organization. But, if they will compare the cost of this increased organization with the losses they sustain in the absence of it, by damage suits, court attendance, and the existing high insurance rates, I believe it will at once appear to them that, ultimately, the suggested system is truly more economical, to say nothing of the protection to human life.

Accidents Increase Cost of Operation

In addition, it is well to remember the increased operating cost an accident incurs. There is a certain overhead burden, or fixed cost, that accrues at night, Sundays and holidays, as rapidly as on working days. There are the equipment, tophouse force, cars, mules and motors, drivers, etc., required to assemble and raise a certain amount of coal. There are entries and narrow-work to be driven, track to be laid, and a certain number of rooms to be turned and worked in order to yield the desired output, at a reasonable operating cost. The working force must be organized and systematized for stability, economy, efficiency and uniformity of output. The accepted orders for coal are in the books; the railroad cars are placed and everything in readiness for a good run, when the engineer is signaled to hoist slowly. Eventually, the trip emerges from the pit mouth with the crushed or

*Chief mine inspector, Birmingham, Ala.

maimed bodies of a miner and his helper and some six or eight rescuers and attendants. What is the result? Two men, either dead, dying, or crippled for life, together with the attendant burial or hospital expenses, lost time of attendants at the funeral or bedside; the working organization of the mine disrupted; lost time of mules and drivers; several rooms out of commission for a day or more; the necessity of cleaning and retimbering the place where the accident occurred and the enforced idleness of the place till another miner comes. But, greater than all is the fact that the productive capacity of one or two men, is, for all time, lost to the company, to their dependents and to society. All for what? *Because he did not know or failed to heed.* In addition to greater safety, greater efficiency and production may be obtained.

Causes of Mine Accidents

On account of the fact that the demand for coal is so much greater than the supply of mine labor, there is a tendency to give men a check number before they are qualified to run a room; and, in many instances, miners who have worked in the mines for years are incompetent because they have never had the proper instruction and supervision, and others are naturally careless and reckless. Practices are constantly engaged in that are incredibly hazardous and which may not come to the knowledge of the mine foreman or fireboss until the damage is done. It is our duty to humanity to prevent, as far as possible, the loss of life and limb occurring through the ignorance of employees. Never let them say, "We did not know." If a man insists upon committing suicide, do not let him do it on your premises; fire him first.

The records show that the cause to which the most frequent fatalities are attributable is falls of roof. The effective way to remove the cause or, at least, to diminish the toll, is to employ constant vigilance and an efficiency of higher standard than is possessed by the average mine employer. To maintain an eternal watch on the men in close proximity to the working faces will always accomplish much. There is no real reason why we should not produce, at least, from three to four hundred thousand tons of coal each year for each life lost, which would place our operations on a parity with other important producing states.

It cannot be truthfully said that natural conditions and hazards are worse here than those in other coal fields. The natural advantages here are equal to those elsewhere. Therefore, as the record stands, it would seem that we are not employing the proper safeguards. I trust that all will indorse the statement that it is incumbent, primarily, upon operators to protect their employees. Mine officials are on duty, in the mine, every working day and should be in better position than the state mine inspectors to keep constant surveillance over the operations of their mines. The inspection department will, of course, continue earnestly to do all that lies in their power, in that direction.

Supervision and inspection, education and instruction, discipline and vigilance are the only antidotes for the causes of avoidable accidents in coal mines. Try the safety instructor and inspector system at your mines and help put Alabama at the head of the list for low coal-mine-accident records.

The Explosions at the East Brookside Mine

The Brookside Colliery of the Philadelphia & Reading Coal and Iron Co. is located at Tower Hill, 19½ miles in a straight line to the WSW of Pottsville on the line of the Philadelphia & Reading Ry. leading from Schuylkill Haven to Lykens. The mine is quite deep and generates gas, several firebosses being employed.

On Saturday, Aug. 2, seven men were working for Charles Portland driving a tunnel through rock. The gang included six muckers and a boss. Apparently as much as 175 lb. of dynamite were taken into the mine that morning for use in the tunnel. By some means this was caused to explode, killing all the men employed.

From all accounts, the explosion disturbed the ventilation, there being some evidence of a reversal of the air current at one of the shafts. However, when twenty minutes after, nine men, two of them firebosses, went down to rescue the victims, they set fire to a body of gas of some sort and an explosion occurred, killing eight of these men. It has been suggested that the gas found was formed by the incomplete combustion of the explosive. Seeing that the slow combustion of 50 per cent. dynamite produces gases containing 24.4 per cent. of carbon dioxide, 31.2 per cent. of carbon monoxide, 20.7 per cent. of hydrogen, 0.7 per cent. of methane and 23.0 per cent. of nitrogen (see Bureau of Mines Bull. 48), it is evident that explosive gases may well remain after a combustion of dynamite. However, the first explosion was sufficiently violent that it is hard to believe the dynamite produced any large percentage of explosive gas.

It is certain that the effect of a violent shock, such as an explosion of equal force to that described, would result in destroying the ventilating brattices, in forcing gas from places where it might have collected and in opening the crevices of the coal so as to permit the escape of occluded gas. Thus concurrently the cleansing draft of air would be removed and the emission of methane increased.

The nine rescuers in the first party were H. Shoffstall, night boss, H. Murphy, fireboss, D. McGinley, fireboss, T. Behny, miner, J. Kopenhaver, shaftman, Howard Hand, laborer, Harry Hand, miner, V. Zanoni, blacksmith, and E. Luchi, a blacksmith's helper. All these men were killed by the second explosion except the first man mentioned.

Another party descended the shaft and found the superintendent, John Lorenz, and Harry Shoffstall. Lorenz had been making an investigation of the mine with John Farrell, the mine foreman, and the two were involved in both the explosions. Lorenz was found crawling toward safety. When the rescuers volunteered to help him to the shaft, he told them: "Never mind me, go and help Jack Farrell; he needs your assistance. Leave me alone and take care of those that need the help more than I do." However, Lorenz later succumbed to his injuries in a Pottsville hospital. He appears to have inhaled the flames of one of the explosions. Hillary Zimmerman was the only man of those in the mine when the first explosion occurred who escaped with his life.

Harry Shoffstall is likely to recover. In all, 19 men were killed; the loss of life would have been far greater, had the mine been in operation, as 500 men are usually employed at the East Brookside colliery.

DISCUSSION BY READERS

The Mine-Air Current and Explosions

The articles bearing on this subject, by John Verner, COAL AGE, Vol. 3, p. 855; and Robert McCune, July 5, p. 25, have raised a very important question in reference to what has always been considered and is still regarded as one of the requirements of safe mining. In my opinion, it is an unwarranted conclusion to regard a ventilating current in a mine as being a source of danger, except only in a limited sense, under certain special conditions. No principle of modern mining contributes more to the health and safety of the miner than that of effective ventilation.

It is wrong to consider a ventilating current in reference to preventing or diminishing the outflow of gas from the strata. That it does this, to a limited extent, is incidental; and to condemn any system of ventilation for not doing what it was not intended to accomplish is unjust.

That a pure, fresh current of air will produce an explosion of firedamp more quickly and cause it to extend farther in the mine than a vitiated atmosphere may be true; but it is equally true that such a current of air properly directed is more effective in diluting and sweeping away an accumulation of dangerous or noxious gases, than is a depleted air current.

The early methods of coal mining were characterized by many unsanitary as well as hazardous conditions, caused mainly by imperfect ventilation or, in many cases, no ventilation at all. The miner readily became a victim of blood and pulmonary diseases. It was no uncommon sight for me, as a boy, to see men, in the prime of manhood, practically incapacitated for mining work, owing to these insidious diseases. Many of these men have struggled on for years, under the spur of necessity, drawing upon their reserved vitality—nature's legacy for old age—to meet the demands of life. No one but those who have lived in such an experience can realize the horrors attending these diseases. Years of untold suffering are followed by the untimely death of a man who was otherwise muscular and vigorous.

If modern methods of mining coal have been increasingly productive of danger, they have at least the redeeming feature that, like Sir Walter Raleigh's ax, they kill quickly; but, it may be said that primitive methods of mining, though slower in action, were none the less certain. We realize that the present demand for coal could not be supplied by primitive methods of mining. It is this increasing demand that has necessitated the introduction of mechanical devices that make possible a larger production of coal. Even with these increased facilities for extraction, the demand for coal still calls for an increase in the number of workers; and these requirements necessitate increased ventilation. It is clear therefore that modern methods of mining are the products of necessity.

A comparison of primitive methods of mining with those now in use seems to point clearly to the fact that the additional dangers in mining arise chiefly from the increased production of coal dust and the distribution of this fine dust throughout the workings. The increased production of fine coal dust can be attributed directly to two causes; namely, the use of machines for undercutting the coal, and the excessive use of blasting powder. In the use of permissible powders, attention has often been called to the fact that the strength of these powders is such as to require a far less quantity of the powder for the performance of the same work.

Modern methods of mine haulage are responsible largely for the distribution of fine coal along the haulage roads. Also, the increased demand for ventilation, necessitating a higher velocity of the air current, has increased the amount of dust carried in the air, which is deposited at points where the velocity of the air is reduced by reason of an increased area of the air passages. The evils arising from new conditions must be met by, first, ascertaining the nature of the trouble and, second, devising and applying the best possible means for overcoming the danger.

Since by far the largest proportion of dust is produced at the working face, it is here that suitable means must be adopted to prevent, as far as possible, its projection into the mine air. The means thus far adopted to accomplish this are not as effective as could be desired. Again, to prevent the distribution of dust along the haulage roads, mine cars should be made dust-proof, and these should not be overloaded. This will not only add to the safety of the mine, but will increase the economy of operation, as it will reduce the cost of keeping the roads clean, which is an item of no small importance in large mines. When proper precautions are taken, in respect to these two conditions, the danger that might arise from ample ventilation is practically removed.

In my opinion, there should be a sufficient quantity of air circulated in every mine to supply ample ventilation to all working places and allow a sufficient scale of air to be taken from each split to properly ventilate the worked-out and abandoned portions of the mine, which, under the old system of ventilation, often accumulated dangerous quantities of gas. An ample and efficient air current is one that sweeps every portion of the mine with sufficient volume and velocity to insure the dilution and removal of the gases generated.

Referring to the remark that is often made, that it is frequently the model and uptodate mine that meets with disaster, I would like to ask: Is this a just criticism or a logical argument against the introduction of approved and tested methods? Cannot the same argument be used to demonstrate the fact that any disaster occurring in such a model and uptodate mine must have resulted from carelessness or reckless indifference to safety and disregard of mine regulations? It must be remembered that a good tool will not compensate for a lack of skill, or for carelessness on the part of the worker.

I. C. PARFITT.

Jerome, Penn.

Mixed Lights in Mining

Observing the great difference in the opinions expressed in reference to the use of mixed lights in mining, in recent letters on this subject, published in COAL AGE, I am led to express my views on this important question, in coal mining.

I believe that conditions can exist, in many mines where gas is given off in dangerous quantities, that will render the use of mixed lights in the mines safe. Suppose, for example, that we were about to open and develop a large coal mine covering a great acreage. The main entries are to be driven due north, for a distance of, say two miles. The mine is found to be gaseous; and, in accordance with Art. 6, Sec. 4, of the bituminous mine law of Pennsylvania (1911), the mine is opened by driving five main entries, two leading from the main opening, and two from the second opening, while the fifth entry is to be used solely as a traveling way.

Now, suppose gas is given off on the west side of the mine only, there being no gas found on the east side; and the circulation of the mine is so arranged that each side has its own separate ventilating current. Under these conditions, I would consider it safe to work with open lights on the east side, while safety lamps are used exclusively on the west side of the mine; but would suggest that all precautions required by law for a gaseous mine should apply also to a mixed-light mine. The fire-boss should examine every working place on the open-light side of the mine the same as he does on the gaseous side.

To attempt to enforce a rule that safety lamps be used exclusively in every section of a mine, simply because gas has been detected by an approved safety lamp in some certain portion of the mine, would be to impose a burden on the miner and operator alike, especially in a mine such as I have described. Where mixed lights are used, under the conditions described, the following regulations should be made and strictly enforced: 1. No man should be permitted to enter the safety-lamp section with an open light. 2. A safety-lamp station should be provided at a convenient point in the mine, and an attendant be on duty at all times during working hours, day and night, to see that no one enters the gaseous section without exchanging his open light for a safety lamp, in accordance with Art. 10, Sec. 4, of the mine law.

If the ventilating system is properly planned, and the overcast and stoppings are substantially built, I believe it is entirely consistent with safety to use open lights on one side and require safety lamps to be used exclusively on the other side of such a mine.

JOS. NORTHOVER, Assistant Mine Foreman,
Berwind-White Coal Mining Co.
Seanor, Penn.

Study Course in Coal Mining

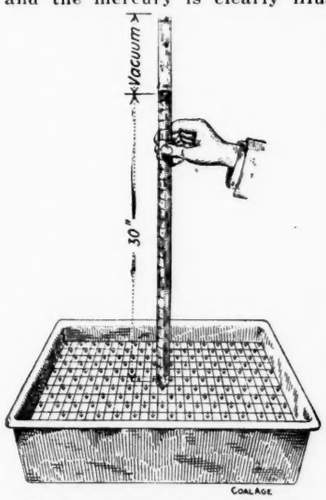
BY J. T. BEARD

The Coal Age Pocket Book

THE PRINCIPLE OF THE BAROMETER

The principle of the mercurial barometer is the balance of pressure between the atmosphere and the column of mercury in the tube. The weight of the atmosphere counterbalances the weight of the mercury column, which rises as the atmospheric pressure increases and falls as it decreases. The height of the mercury column is therefore a true index of the pressure of the atmosphere at the surface of the earth, at the moment of taking the observation.

The principle of the balance of pressure between the air and the mercury is clearly illustrated in the accompanying figure where a glass tube, closed at one end, is shown supported in a basin of mercury. The surface of the liquid in the basin is divided into imaginary squares, by lines one inch apart; and the small arrow-heads represent the pressure of the atmosphere exerted on each square inch of surface.



ILLUSTRATING THE PRINCIPLE OF THE MERCURIAL BAROMETER

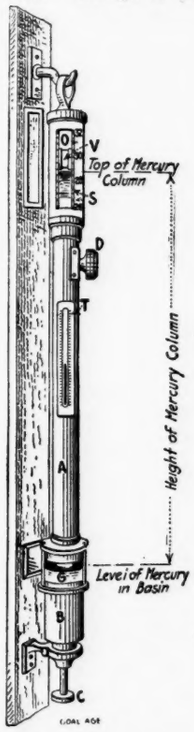
Suppose for a moment, that the column of mercury in the tube is exactly one square inch in cross-section; it is evident, in that case, that the mercury column takes the place of the atmospheric pressure on one square inch of surface; and, since there is perfect equilibrium, its weight is equal to the pressure of the atmosphere per square inch.

Furthermore, whatever the sectional area of the mercury column, it is clear that its weight will always equal the atmospheric pressure for the same area of surface. Hence, the area of the mercury column is not important, but its height only.

If the weight of one cubic inch of mercury (0.4911 lb.) be multiplied by the height of the column of mercury, as measured in inches, the product will be the pressure of the atmosphere, in pounds per square inch, at the place where the observation was taken. This assumes, that the barometric reading has been reduced to a standard reading, at a temperature of 32 deg. Fahrenheit, which is common practice.

The Coal Age Pocket Book

Description of the Instrument—In the accompanying figure is shown the common form of the standard mercurial barometer. The glass tube that contains the mercury column is here inclosed in the metal case A, to the bottom of which is attached a somewhat larger casing B. The latter holds a glass cylinder G terminated at the bottom with a chamois-skin bag, the whole forming the basin that holds the mercury.



THE STANDARD MERCURIAL BAROMETER

The entire case AB is hung in a truly vertical position, supported on a substantial base, as shown in the figure. The top of the mercury column is observed through the opening O, in the upper end of the case. In this opening, is arranged a sliding vernier V, which can be adjusted, by means of the thumbscrew D, so that its lower edge exactly corresponds with the top of the mercury column. The position of the vernier is then read on the scale S marked on the sides of the opening in the case. This scale is graduated in inches, but only extends an inch or two above and an equal distance below the normal barometric reading. The normal reading at sea level is about 30 in., and the scale extends from 26 to 32 inches.

Before setting the vernier, however, it is necessary to adjust the level of the mercury in the basin so that it corresponds exactly with what would be the zero of the extended scale. To enable this to be done with precision, there is attached to the scale a long rod that extends downward inside the casing. The lower end of the rod is drawn to a fine point that marks the zero of the scale.

To adjust the level of the mercury in the basin, the thumbscrew C is turned. This screw bears against the bottom of the chamois-skin bag and operates to raise or lower the level of the surface of the mercury in the glass cylinder. The adjustment is complete when the fine pointed end of the rod is seen to just prick the surface of the mercury. The point of the rod is observed through the glass cylinder above the surface of the mercury.

A thermometer T is shown attached to the metal case. In making accurate observations it is necessary to reduce all readings to standard readings.

INQUIRIES OF GENERAL INTEREST

The Air Chamber of a Pump

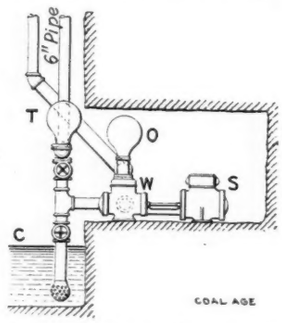
Please explain the principle of the air vessel (chamber), as used on mine pumps? Show by sketch how the air vessel should be fitted to a pump.

PUMPMAN.

West Elizabeth, Penn.

The purpose of the air chamber is to maintain a continuous flow of water in the discharge pipe of a reciprocating pump. In this type of pump, the water in the discharge pipe would come to rest between each stroke of the pump, as the action is intermittent.

In the accompanying figure the air chamber *O* is fitted, by a T, to the discharge pipe, immediately above the valve chest of the water cylinder W of the pump; *S* is the steam cylinder. The air chamber is simply a closed chamber of spherical shape. The air in this chamber is compressed by the weight of the water in the column pipe. When the pump ceases to act between each stroke the pressure of the air acting on the water maintains the flow in the discharge pipe the same as though the pump was in action, because the pressure of the air in the chamber is equal to the pressure against which the pump operates. It is important that the air chamber be located in direct connection with the discharge pipe and as close to the water cylinder of the pump as possible.



A MINE PUMP ARRANGED TO DRAIN TWO BASINS

The pump shown in the figure is arranged either to draw its water from the sump *C* below the pump, or to be fed from another water basin a short distance up the shaft. In this arrangement, however, a second air chamber *T* is required to be attached to the pipe leading from the upper basin.

Effect of Sulphur on Mine Fire

If, just before sealing off a mine fire, a large quantity of sulphur is ignited, what effect would this have on the fire after it was sealed off?

J. C. HAYSLETT.

Arjay, Ky.

We suppose this question refers to the burning of a considerable quantity of pyrite, in the coal seam. Pyrite (sulphide of iron, FeS_2), as found in coal seams, is commonly called "sulphur," by the miner. A considerable quantity of this pyrite disseminated in the coal would give off, under the action of the fire, sulphurous fumes (SO_2), which are suffocating and extremely poisonous. In the presence of moisture, there would be the possibility of the formation, besides, of hydrogen sulphide (H_2S), which, next to carbon monoxide (CO), is the most dangerous gas known to mining.

The only effect the sulphurous fumes would have on the fire itself would arise from the dilution of the air with an extinctive gas and the consequent depletion of the available oxygen, which would reduce combustion and tend to extinguish the fire.

Effect of Washing Coal

We are preparing to put in a coal washer and would like to ask for a little information as to what results may be expected.

An analysis of the coal, before washing, is as follows:

Fixed carbon	65.80 per cent.
Volatile matter	29.71 "
Moisture	1.21 "
Ash	2.28 "
Sulphur	1.00 "
Total	100.00 per cent.

The tests we have made show that 93.5 per cent. of the washed coal passing through a ¾-in. revolving screen will pass over a $\frac{1}{32}$-in. mesh, the remaining 6.5 per cent. passing through that mesh. Analysis shows that the larger of these two sizes of screenings contains 2.06 per cent. ash and 0.95 per cent. sulphur. The smaller size contains 13.45 per cent. ash and 1.59 per cent. sulphur.

We wish to know what percentage will be added to the value of what remains after washing, by taking out the screenings that pass through the $\frac{1}{32}$-in. screen.

We also desire to ask what value the part taken out would have as a fuel; and what arrangement of furnace or appliances would be required to burn it successfully, either in stationary or locomotive boilers. We could possibly use this portion of the screenings ourselves, as we have both kinds of boilers.

L. K. Moss,
Supt., Mabel Mining Co.

Warrior, Ala.

The above inquiry, submitted to A. J. Sayers, engineer for the Link-Belt Co., Chicago, Ill., elicited the following reply:

The question of your correspondent cannot be answered satisfactorily without making quite extensive tests on samples of the coal in question. Without doubt, the value of the coal for blacksmithing purposes would be increased by screening out the $\frac{1}{32}$-in. screenings. This is clearly shown from the analysis given of these screenings.

As there is only 6.5 per cent. under $\frac{1}{32}$ in., it does not affect the general sample to any great degree, in spite of the fact that this small percentage runs very high in ash and sulphur. The only suggestion we would have to make would be for Mr. Moss to screen out and re-treat the coal from $\frac{3}{16}$ in. or ⅛ in. down, mixing it with the other size for his market. This could be done successfully by the ordinary Foust or Feldspar Luhrig Jig.

We are not in position to tell Mr. Moss the exact commercial value this would be to him, or to answer his question in regard to the analyses of the screenings. We do not believe, however, that it would pay him to screen out this fine product and try to consume it in his own boilers. It would be a very uneconomical coal to burn, under ordinary conditions, and the treating of a small percentage would not be an inexpensive proposition for him.

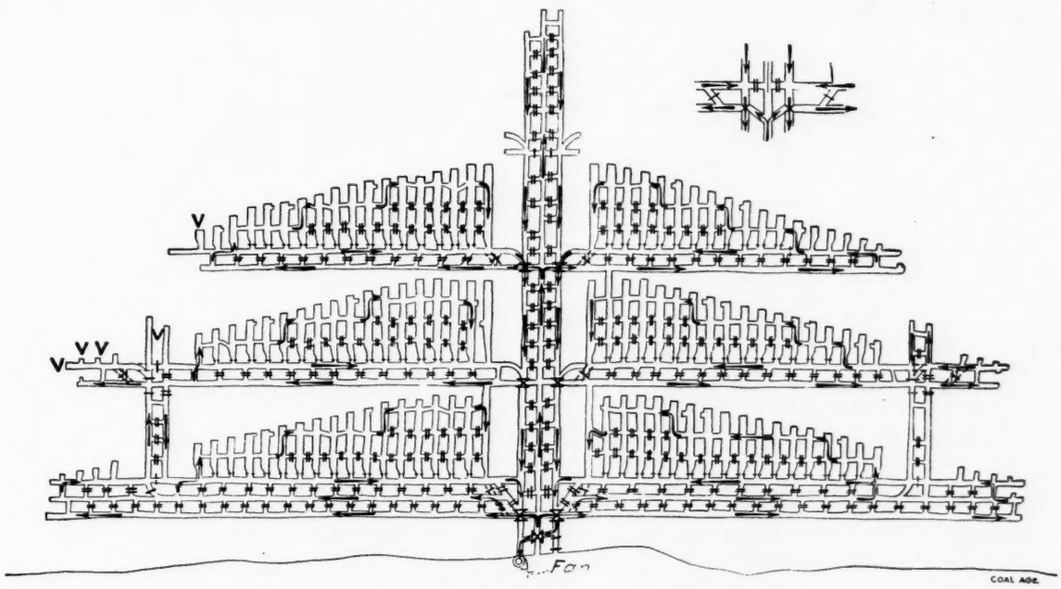
EXAMINATION QUESTIONS

Mine Development

(*West Virginia Examination*)

Ques.—Locate on the accompanying plan, the position of the fan and show the method of ventilation, by marking thereon the different overcasts, doors, stoppings or brattices, regulators, curtains or check doors, and the direction of the air currents, by means of the indicated symbols. Note any violation of the mine law by the letter *V*.

Ans.—In reply to this question, we have marked on the mine plan, the position of the several overcasts, doors, stoppings, etc., and indicated by arrows the direction of the air currents. The triple-entry system shown on the plan suggests the possibility of this being a gaseous mine; and we have adopted an exhaust fan, placed at the mouth of one of the side entries, flanking the main haulage road, which is thus made the main intake for the mine.



SHOWING DEVELOPMENT OF A WEST VIRGINIA MINE

Ques.—State your opinion as to whether or not this mine is being properly developed.

Ans.—This mine is evidently planned for an output of, say 1000 tons per day. It is divided, by the cross-headings, into sections capable of producing, in 6-ft. coal, under fair conditions of roof and floor, say 150 tons per day, per section. If, however, the total output of the mine should exceed 1000 or 1200 tons per day, it would be preferable to use a four-entry system for the main roads and airways. This would provide separate roads for the loads and empties on the main-intake airways and separate return airways for the two sides of the mine, assuming a gaseous mine.

The proposed plan of dividing the mine into separate sections is good, providing each section is worked out regularly and closed promptly when the same is abandoned. The method of holing through the first or second room on each pair of entries provides good ventilation until such time as the overcast on the main return is built at the mouth of the cross-entry, which should be done as soon as the development of that pair of entries will warrant the expense of the overcast. A substantial stopping should then be built where the room holed through into the entry.

Ques.—Would you change this method of mining? Give reasons.

Ans.—We have indicated in the small detailed sketch an improved arrangement at the mouth of each pair of cross-entries. An oblique crosscut should be provided between the two cross-entries of each pair, at the mouth of the first room on each entry, to allow the coal in that section to be hauled out on the intake air. An overcast is built on the main-return airway, at the mouth of each pair of cross-headings.

Ques.—How would you begin to draw pillars in this mine?

Ans.—This will depend on the nature of the roof and floor. Under fair conditions, the rooms can be held open until the last room is driven on each section; and many would prefer to begin drawing the pillars, in each section, as soon as the last room had reached the limit. Under certain conditions, however, it will be impracticable to hold the rooms open this length of time, and the drawing of pillars should then be commenced as quickly as each room reaches the limit. In every case, the line of pillar work should be kept as uniform as possible.

[The two remaining questions on this map will follow next week.—ED.]

COAL AND COKE NEWS

Washington, D. C.

Representative Murray, of Massachusetts, has taken action which is calculated to hasten the rendering of the decisions in the anthracite coal cases, which are being held back to an unexpected degree by the Interstate Commerce Commission. Mr. Murray has introduced a resolution (Aug. 1) calling for an investigation by the Government that will bring out the fact on the following points:

1. Capitalization, ownership and control of the Pennsylvania anthracite mines.
2. Intercorporate relationships of the coal-mining, coal-handling, and coal-selling companies, and in the companies transporting coal by water and rail.
3. The total revenues, expenses and profits of the anthracite-mining companies for a period of years.
4. The total revenues, expenses and profits of the anthracite-carrying railroads for a period of years.
5. Wholesale prices of anthracite coal at the mines and at the principal distributing points, and retail prices of coal in the principal cities.

Much of this ground was covered in the anthracite coal inquiry of last year and part of it has been published in a government report. Mr. Murray in fact admits this, saying:

I have reason to believe that there is now on hand in the executive departments enough data to show that 90 per cent. of the available anthracite coal, and between 85 and 90 per cent. of the anthracite shipped each year is in control of the seven railroad systems which form the only means of transporting the coal to the markets. These roads are bound together by their common interests, by interlocking directorates, and by agreements of various kinds so that they act as a unit in controlling the price of anthracite coal. For example, the net earnings of the Philadelphia & Reading Coal & Iron Co. for the last half of 1912 were $2,921,139 or nearly ten times as great as they were for the last half of 1911.

Mr. Murray's action is understood to be due to widespread complaints in New England regarding both price and supply of anthracite, and it is believed that there will have to be a renewal of the subject notwithstanding that rather elaborate inquiry was devoted to it only about a year ago while a report was filed less than six months ago.

Reasonable Time Defined

The Interstate Commerce Commission has handed down opinion No. 2405 in which it refuses to award reparation to a retail coal dealer for excessive rates inasmuch as he had been advised by the Commission that his claim informally presented would be considered only on the formal docket, yet took no action for five years and then filed a complaint. This amounts to a definition of the meaning of "reasonable time" for the presentation of complaints and is equivalent to the statement that all such demands lose their basis if they are withheld beyond the time when they might by the exercise of "due diligence" have been presented.

The Earnings of West Virginia Miners

Statements made public here show that according to the West Virginia Department of Mines, the average earnings of miners for the year ending June 30, 1912, were $618.52, the highest average earned by soft-coal miners anywhere. West Virginia is a nonunion state. In the unionized state of Illinois the average earnings of miners in the same year, according to the State Department of Mines, were only $556.33, or $62.19 less than the nonunion miners of West Virginia averaged.

Men who belong to the union must pay dues and assessments, which according to statements published in the United Mine Workers "Journal," amount at present to 25c. with strike assessments of 50c. each semi-monthly payday or $18 a year. The 400,000 members of the United Mine Workers, at present rates of collection appear to be yielding a fund of $7,200,000 annually. It is estimated that if the 69,611 miners of West Virginia can be added to the union rolls, they will increase this sum at the present rate by $1,252,998 a year.

So eager are the union officers to increase the receipts of the general treasury that in the so called "Paint Creek Settlement," which really was a settlement with only two companies, the officers actually signed a contract binding their members to return to work for less money than the companies had offered to pay before the strike began.

HARRISBURG, PENN.

The officials of the United Mine Workers hold out little hope that the coal operators will accept the proposition of the miners to establish a "check-off" in the anthracite region as a remedy for the frequent petty "button strikes," which have prevailed ever since the ratification of the 1912 agreement, due mainly to the refusal of the men to join the union or pay dues toward the support of the organization. The plan was proposed at the convention recently held in Wilkes-Barre. The proposition has not yet been presented to the operators, but preliminary arrangements are now being made to do so at an early date.

The argument of the men in the union is that this is the only way to stop the trouble, and they point out that it is as much to the advantage of the companies to adopt this method as it will be to the union.

John P. White, national president of the mine workers, is expected to be in the anthracite region in the course of a few weeks. The principal purpose of his visit is to urge the men to refrain from these petty strikes. His argument will be that the operators will use these strikes as a reason for not entering into a new agreement with the miners' organization upon the expiration of the present contract.

In the Schuylkill region last week about 200 rock men employed by contractors went on strike for an increase in wages, and all rock work in tunnels being done by the Lehigh Valley and Reading companies between Centralia and Mahanoy City came to a standstill. The 1100 employees of the William Penn Colliery of the Susquehanna Coal Co. went out on strike on account of the dockage question, but the men agreed to return to work and then adjust their troubles. At the Midvalley Colliery of the Midvalley Coal Co. and the Cameron Colliery of the Mineral Railroad & Mining Co., "button strikes" are in order. The Beaver Brook Colliery of the Dodson Coal Co. is about the only one that has not had a case before the Conciliation Board this year.

Following a conference held last week between Governor Tener, representatives of the Attorney General's department, Auditor General Powell and State Treasurer Young, Auditor General Powell decided to pay state funds to virtually all state departments.

These payments will start as soon as vouchers are presented from the various departments which the Auditor General believes are not legally created because not contemplated in the Constitution.

Governor Tener has re-named the State Industrial Accident Commission. To this body he will intrust the important duty of framing a workman's compensation and employers' liability act for submission to the next session of the Legislature.

The Commission will be instructed to get the views of all interests on the subject and to frame a bill that, if possible, will meet with less opposition than that which failed during the last session because neither labor nor capital could come to an agreement as to its provisions.

Morris Williams, president of the Pennsylvania Coal Co., and Francis Feehan, a former district president of the United Mine Workers, are among those appointed on this commission.

PENNSYLVANIA

Anthracite

Scranton—Workmen in the Greenwood mine of the Delaware & Hudson Co. had a narrow escape from death on July 29, when lightning entered a chamber by means of an electric feed wire and fired three sticks of dynamite that had been placed preparatory to a blast. Three men had just left the chamber when the charges went off. The battery wires were burned out and the trail of the bolt could be followed from the surface through a slope to its entrance into the chamber. The accident is the first of its kind in this end of the anthracite coal fields.

Wilkes-Barre—A suit in trespass against the Wilkes-Barre Anthracite Coal Co. has been filed, asking $25,000 damages. The suit grows out of a case where a pumprunner had his clothing caught in the gears of a machine in the company's mine.

The Kingston Coal Co., on Aug. 1, filed a cross bill in equity against the Delaware, Lackawanna & Western R.R. Co. over the ownership of coal lands, in which over $1,000,000

is involved. The case grows out of an agreement made in 1862 when the Lackawanna Co. leased certain coal lands, and then entered into an agreement with the Kingston Coal Co., whereby the latter company was to mine the coal, it being cheaper for the railroad company to have the coal mined by the Kingston people than erect its own collieries.

Pittston—The Pennsylvania Coal Co. has just completed a modern electric plant at the old Schooley shaft, and expect to supply the various collieries in the south district with electricity in the near future. The culm bank at the old Schooley plant will be utilized for fuel. Electricity will be furnished in the beginning to old No. 2 shaft and to No. 9.

Shenandoah—Six miners and laborers were entombed for some hours on July 29 at the William Penn colliery near here shortly after they had started work in No. 2 Lift. After the fall of rock occurred shutting them off from the rest of the mine, other employees lost no time in starting a rescue party, and by 2 o'clock in the afternoon all of the men were brought out alive and apparently little the worse for their experience.

Tamaqua—Sparks from an electric motor in the No. 4 mine of the Lehigh Coal & Navigation Co. set fire to a body of gas on July 29, as a result of which three men were badly burned. The men were employed on the gangway when the explosion occurred and were hurled a considerable distance by its force.

An explosion of gas at the Buck Ridge Colliery of the Philadelphia & Reading Coal & Iron Co. at Shamokin on the same day seriously if not fatally burned two miners.

Bituminous

Beaverdale—The Beaver Run Coal Co., on July 1, formally opened a new stone club house for its employees. This is equipped with gymnasium apparatus and is generally similar to a Y. M. C. A. F. B. Cortright, secretary of the company, of Philadelphia, presided at the opening of the new building.

Johnstown—Judge M. B. Stephens has granted an injunction to the Morrellville Coal & Coke Co. against the Morrellville Coal Mining Co., restraining the latter from mining further coal. The case is an unusual one, involving the designation of the amount that is to be allowed the operating company for faults in the coal. The holding company maintains that the operating firm is in arrears with the royalty, while the operating company maintains that it has paid excess royalty amounting to $50,000. Another injunction was applied for some time ago in the Blair County Courts and Judge Stephens will hold a hearing in that case soon to receive testimony growing out of the dispute.

Kaylor—The mines at Kaylor, formerly operated by the Great Lakes Coal Co., but now owned by the North Penn Coal Co., recently resumed operations under new management. Two of the mines are now working and as rapidly as men can be secured the others will be again opened. It is the intention to again operate this group of mines to their full capacity.

Pittsburgh—Three separate answers of the Monongahela River Consolidated Coal & Coke Co., the Pittsburgh Coal Co. and the Union Trust Co., of Pittsburgh, trustees, defendants in a bill in equity, filed by Alexander Dempster, were filed in the local court at Pittsburgh on July 31. All three answers declare that Dempster has no standing in a court at law under the equity proceedings and ask that the bill be dismissed.

The answer of the Pittsburgh Coal Co. declares that Dempster, a minority stockholder of the Monongahela Co., without averments of fraud or danger of insolvency and sufficient facts in support thereof, seeks by a decree of court to control the corporate property of the company and personally dictate its management. By comparison of the defendants' holdings of stock in the company and the stock held by the plaintiff it is alleged that the acts complained of do not warrant or justify a decree in his favor.

A statement of the affairs of the company shows that in 1909 they lost $376,155.43 through the loss of coal fleets sunk in the Mississippi River by storms. In 1910, the profits are given as $231,222; in 1911, $355,789; and in 1912, $708,539; and it is asserted the profits of the present year will exceed those of last year.

WEST VIRGINIA

Charleston—With but one exception every local miners' union on Cabin Creek reported Aug. 1 that they had ratified the terms of an agreement by which the long coal strike will be officially ended.

Fayetteville—A strike was recently declared at the Cranberry mines in Raleigh County at a property of the New River Co. The cause of the disturbance was a controversy between a union and non-union employee, the non-union man refusing to join the miners' organization, and when urged too strongly by the union man, defending his stand with his fists. The matter is to be submitted to arbitration and the striking men have gone back to work.

Morgantown—The mine rescue course given in connection with the department of mines of the college of engineering at the State University of W. Va. is an accredited training course of the Federal Bureau of Mines. Summer school students in mining engineering have received certificates from the Federal Bureau for their mine rescue studies.

KENTUCKY

Fleming—The Elkhorn Fuel Co.'s new town of Fleming has filed application in due form before the Circuit Court of Letcher County for incorporation under the laws of the state. The court is asked to appoint five trustees, a marshall and an assessor, the petition being signed by the due two-thirds of the qualified voters of the town.

Harlan—The Harlan Coal Mining Co. is one of the eastern Kentucky operators which has been so crowded with orders from the territory north of the Ohio that it has had difficulty in keeping up with its regular business. On this account it has been forced to decline all orders or offers from others than its established customers, and to limit the amount of coal that even these favored customers may take at this time. The company has in several cases had to buy outside coal to take care of orders, nearly always at prices as high as it received, and in some cases higher.

TENNESSEE

Knoxville—Considerable interest is already being manifested by Kentucky mine operators and their employees in the great miners' field day, to be held at Knoxville, Sept. 20. Between 30 and 40 teams have been entered, and are receiving minute instructions and hard training to fit them for their contest for the rich prizes to be awarded. An unusual feature of the meeting will be a demonstration of the manner in which coal-dust explosions occur, and their danger. A big steel tube made for that purpose will be used by the Bureau of Mines in this demonstration. Twenty-five thousand miners are expected to be present. The exercises on Miners' Day will be held under the auspices of the Tennessee Mine Foremen's Association, the American Mine Safety Association and the American Red Cross.

OHIO

Martin's Ferry—The mine of the Powhattan Coal Co., which was to have been opened shortly, will not be started until about the first of the year. The principal reason for this postponement of operations seems to be that all bids received for building tracks, tipples, power house, etc., were considered too high on account of the scarcity of labor. It is believed that labor conditions will be easier in a few months.

New Lexington—Referee in Bankruptcy E. R. Mayer has made public his finding in the bankruptcy case of the Saltillo Coal Co., showing that the company is insolvent. The finding shows the company's indebtedness to be about $33,050 and the assets $23,500.

Columbus—Senator William Green, author of the bill to require the weighing of coal to determine the wage of miners, before screening, addressed the state commission appointed by the governor to investigate the subject recently in the senate chamber at Columbus, Ohio, giving his reasons for introducing the bill.

The introduction of the bill, he said, naturally followed the adoption of the amendment to the constitution making such a statute proper, and valid, and the vote on the amendment showed that the people were in sympathy with the proposition. In 1898 such a law was enacted, but the supreme court set it aside. If the organic laws of the state had been in 1898 as they are now, this dispute would not be in progcess. It would have been settled long ago.

INDIANA

Boonville—Several convictions have been secured recently at Boonville, Ind., by John C. Wright, a deputy state mine inspector, under the mining law of Indiana. The charges were various, including failure to provide ventilators, make break-throughs and furnish timbers.

Hymera—Five men were probably fatally burned, and 18 others severely injured in a dust explosion at Jackson Hill mine No. 2, three miles east of here on Aug. 1. Rescuers suc-

ceeded in bringing out all of the injured miners alive, but the mine property was heavily damaged. It is believed the dust was fired by a windy shot.

ILLINOIS

Watson—Leases are sought on 10,000 acres of coal land in a contiguous body near Watson on either side of the Illinois Central R.R. These leases are drawn for two years and represent the Consolidated Coal Co., of St. Louis and Chicago. It is believed from oil-well drillings that coal in paying quantities underlies Watson and the surrounding country.

Clinton—An inspection was recently made of mine No. 4 of the Big Creek Coal Co. looking toward the installation of electric machinery therein. Many of the larger mines in Fulton County have adopted electric power systems and those who have not done so are making preparations therefor.

Hillsboro—The Peabody coal mine after being shut down to make extensive improvements for several months has recently resumed operations. Inside of a month it is expected that this mine will employ about 350 men. This number will be increased constantly for several months.

OKLAHOMA

McAlester—As the result of injuries received in a gas explosion in mine No. 4 of the Union Coal Co., at Adamson, on July 25, Jake Blevins, a coal miner, died in the local hospital here on July 28.

FOREIGN NEWS

Juneau, Alaska—The commissioner of the general land office has canceled the Alaska coal claim of James Wardell, of Juneau, on land adjoining the Cunningham group in the Bering River region. This is the first Alaska coal cancellation since the voiding of the Cunningham claim in 1911. Forfeiture was on account of failure to open and improve the land.

Antofagasta, Chile—J. Bartman Coleman and J. Yeams, of the Caledonian Collieries Co., Ltd., of Australia, have left on an extensive inspection trip in the interior. They expect to look at a number of coal prospects before returning. They also will study the fuel question at various nitrate concessions, where the increasing use of fuel oil is making considerable inroads in the coal tonnage consumed.

Glasgow, Scotland—Twenty-two coal miners perished in the fire which broke out Aug. 3 in the Mavis Valley pit of the Cadder Colliery near here. Their bodies have been recovered. Only one man escaped alive of the shift of miners in the pit at the time of the fire. A widow lost three of her sons. The rescuing parties passed through a severe ordeal, owing to the intense heat and poisonous gases, and many of them were brought to the surface unconscious.

COAL AND COKE PATENTS

Improvements in Collapsible Wooden Mining Props, H. Heidkamp, 117 Blüthenstrasse, Hamborn-Neumühle, Rheinland, Germany, 17,557 of 1912.

Apparatus for Discharging Substantially Vertical Retorts for the Destructive Distillation of Coal, H. W. Woodall and A. McD. Buckham, assignors to Isbell-Porter Co., Newark, N. J., 1,065,572, June 24, 1913, filed Feb. 1, 1913, serial No. 475,474.

Steam Boiler Furnace, J. McMillan, Chicago, Ill., 1,065,702, June 24, 1913, filed Mar. 23, 1912, serial No. 685,745.

Means for Securing Combustion of Coal, J. H. Parsons, assignor to Parsons Engineering Co., Wilmington, Del., 1,066,044, July 1, 1913, filed Apr. 15, 1908, serial No. 427,119.

Method of Securing Combustion of Coal, J. H. Parsons, assignor to Parsons Engineering Co., Wilmington, Del., 1,066,043, July 1, 1913, filed Nov. 1, 1907, serial No. 400,169.

Mechanical Stoker, E. C. Cramp, Harrisburg, Penn., 1,066,254, July 1, 1913, filed May 2, 1912, serial No. 694,656.

Method of Regulating Generation in Gas Producers, L. R. C Chowning, Corning, N. Y., 1,066,252, July 1, 1913, filed Jan. 25, 1913, serial No. 744,256.

Miners' Emergency Case, E. M. Johnson, Bishop, Penn., 1,066,449, July 1, 1913, filed Aug. 12, 1912, serial No. 714,568.

Soot Boiler Cleaner, L. J. Bayer, assignor to Bayer Steam Soot Blower Co., St. Louis, Mo., 1,066,244, July 1, 1913, filed Oct. 9, 1912, serial No. 724,757.

Mine Car Wheel, W. J. McDonald, assignor to American Car & Foundry Co., St. Louis, Mo., 1,066,638, July 8, 1913, filed Dec. 21, 1912, serial No. 737,034.

Coal Leveling Machine for Bee-Hive Ovens, W. Sangster, J. S. Ham, assignors to Covington Machine Co., a corporation of Virginia, 1,067,221, July 8, 1913, filed Aug. 24, 1908, serial No. 450,115.

Gas Producers, H. L. Douherty, New York, N. Y., 1,066,717, July 8, 1913, filed Dec. 27, 1909, serial No. 535,037.

Coal Leveling Machine for Bee-Hive Ovens, W. Sangster, assignor to Covington Machine Co., a corporation of Virginia, 1,067,199, July 8, 1913, filed July 7, 1908, serial No. 442,305.

Smoke Preventer, G. H. Maynard, New York, N. Y., 1,067,826, July 22, 1913, filed July 25, 1912, serial No. 711,607.

Self-Coupling Mine-Car Bumper, E. Stark, Munger, Mich., 1,067,384, July 15, 1913, filed Sept. 12, 1912, serial No. 720,035.

Coal Leveling Machine, P. H. Douglas, assignor to Wellman-Seaver-Morgan Co., Cleveland, Ohio, 1,067,240, July 15, 1913, filed Dec. 20, 1911, serial No. 666,948.

Coal Transferring Apparatus, Charles Marcello, Pickayune, Miss., 1,067,615, July 15, 1913, filed May 8, 1912, serial No. 695,921.

Smoke Purifier, J. Delaney, Milwaukee, Wis., 1,067,321, July 15, 1913, filed Sept. 8, 1911, serial No. 648,271.

PERSONALS

James Bagley has been appointed state inspector of coal mines at Seattle, Wash., taking the place of D. C. Botting, resigned.

John Reynolds, of Eagan, Tenn., has resigned the position of superintendent of the Eagan mine of the Campbell Coal Mining Co. of that place.

J. J. Rutledge and J. M. Jones, of the Federal Bureau of Mines, have been making an inspection of the Birmingham district with the purpose, it is believed, of preparing a report upon the explosibility of coal dust for the Bureau of Mines.

Hugh McDonald and W. W. Smith, of Minot, N. D., have been inspecting various coke plants in the Connellsville region, with the idea that they will shortly construct a coking plant at their mining property near Minot and produce a domestic coke from North Dakota lignite.

The Chief of the Department of Mines, of Philadelphia, Hon. James E. Roderick, has appointed Harry Phythyon, of West Middlesex, and Thomas H. Thompson, of Finleyville, to be inspectors of mines in the bituminous region. Mr. Phythyon will have headquarters at Belle Vernon, Fayette County. Mr. Thompson will have headquarters at Punxsutawney, Jefferson County.

Governor Tener announced on Friday, Aug. 2, that he had named the following men to constitute the new Public Service Commission of Pennsylvania: Nathaniel Ewing, Fayette County, head of the State Railroad Commission, which is supplanted by the new commission, chairman; ten-year term. S. Larue Tone, Allegheny County, general manager and chief engineer of the Pittsburgh Railways Co.; nine-year term. Samuel W. Pennypacker, Montgomery County, ex-governor and member of the old Railroad Commission; eight-year term. Emory R. Johnson, Philadelphia, professor of transportation and commerce expert, University of Pennsylvania; eight-year term. Milton J. Brecht, Lancaster County, member of old Railroad Commission; six-year term. Charles F. Wright, Susquehanna County, ex-state treasurer; five-year term. Frank M. Wallace, Erie, treasurer of the Pittsburgh Coal Co.; four-year term.

TRADE CATALOGS

The Electric Controller & Mfg. Co., Cleveland, Ohio. More Chips. Booklet, describing the automatic control of machine tools; 31 pp., 8x10½ in., profusely illustrated.

CONSTRUCTION NEWS

Whitesburg, Ky.—The Elkhorn Mining Corporation organized for the purpose of developing land in the Boone's Fork and Beaver Creek field has made the announcement that actual development work is to be started immediately.

Peoria, Ill.—The Chicago and Northwestern Ry. has started the laying of rails upon its new coal road now being built from Peoria south, to tap the coal field in Macoupin County. Winston Bros., of Minneapolis, have the contract for the work. For several years the Northwestern has had this project in mind, but because of adverse conditions in the Northwest it was not deemed feasible until the present year to begin actual operation.

Punxsutawney, Penn.—With 11 new openings supplementing the six old ones, a new tipple under construction, a power plant and a two-mile extension of railroad being built to a 17,000-acre tract of coal land, the Madeira-Hill Coal Mining Co. has improvements under way which promise to revive in a large extent the mining industry of Clover Run. This operation is located in Clearfield County on the road from Mahaffey to DuBois, about six miles from Hillman.

Fairmont, W. Va.—It has been announced that the Elkhorn Fuel Co. is about to begin the extensive construction necessary in connection with its plant for developing 300,000 acres of coal land in Kentucky and West Virginia. This corporation has awarded a contract to the Nicola Building Co., of Pittsburgh, for the construction of 1000 buildings in connection with the plan for a modern mining town in Letcher Co., Ky., where developments will begin.

Birmingham, Ala.—The Tennessee Coal, Iron & R.R. Co. have recently announced five distinct improvement projects, which involve the expenditure of a considerable appropriation. These improvements embrace: One school house at Edgewater, and 100 dwelling houses at the same place. A domestic water supply at Iskooda Mine. Sanitation at Muscado, Fossil, Iskooda and Patten. Electric pumping improvements at Pratt No. 1 division. Opening No. 9 slope at Blocton to take the place of the old slope being exhausted or worked out.

NEW INCORPORATIONS

Indianapolis, Ind.—The Sedalia Lumber & Coal Co., of Clinton County, has dissolved.

Chicago, Ill.—The Benton District Coal Co. has increased its capital stock from $20,000 to $30,000.

Stephens, Tenn.—The Stephens Land & Coal Co. has been incorporated with a capital stock of $20,000 to develop coal deposits.

Connellsville, Penn.—The Margaret Smokeless Coal Co. has been chartered by Henry C. Mills, Patton, Penn., Geo. S. Good, Lockhaven, Penn., and F. J. Dixon, of Blairsville, Penn. The capital stock is $10,000.

Indianapolis, Ind.—The Ayrdale Coal Co., of Terre Haute, has been incorporated with a capital stock of $5000 to operate a mining company. The directors are: W. J. Freeman, C. J. Freeman, Jasper Schloat, W. A. Craig and Walter Bledsoe.

Columbus, Ohio—The Bell Block Coal Co., of Columbus, Ohio, has been incorporated with a capital stock of $10,000 to mine and deal in coal. The incorporators are: P. W. Barricklow, W. H. Barricklow, W. O. Copeland, Ethel E. Plant and W. H. Plant.

Madison, Wis.—The Elkhorn Gas Coal Mining Co. has been organized in West Virginia and incorporated by Milwaukee men. The capital stock is $2,000,000, of which $1000 represents the property owned in Wisconsin. Ferdinand Schlesinger is president; Henry J. Schlesinger, vice-president; Armin J. Schlesinger, treasurer, and Edward G. Wilmer, secretary.

INDUSTRIAL NEWS

Birmingham, Ala.—The operations of the Dayton Coal & Iron Co., at Dayton, Tenn., have all closed down recently for an indefinite period.

Pittsburgh, Penn.—The Hirsch Electric Mine Lamp Co. has moved its factory to the corner of 12th and Wood Sts., where its manufacturing facilities are greatly increased.

Connellsville, Penn.—The H. C. Frick Coke Co. has shut down three Leisenring plants indefinitely, throwing 1500 men out of employment, and blowing out 2000 ovens. Some other operators are also putting ovens out of blast.

Fairpoint, Ohio—It is reported that a new coal mine will be opened at Fairpoint in the near future. It is rumored that the mine will be opened by the owners of the Edghill mine north of Bellaire. No definite information can as yet be had upon this point.

Peoria, Ill.—Walter Ohlander and John Kietzler, of Pekin, have leased the Lake Erie coal mine between Wesley City and East Peoria. At present they are getting the mine into shape and are giving work to 25 men. They expect to employ a force of from 75 to 100 men during the winter.

Battle Creek, Mich.—Intending to take no chances of a possible strike the Grand Trunk R.R. is stocking 66,000 tons of coal on the flat below the Verona road crossing. The railroad has already 22,000 tons of coal in its regular storage yard near the locomotive shop, but this is only a small part of what may be needed.

Parkersburg, W. Va.—The United States Lumber Co. and the Tri-State Investment Co. have just closed a deal with Philadelphia and Scranton capitalists whereby they disposed of their combined interest in the coalfields of Highland, Bath and Augusta Counties in Virginia, and Pendleton County, in West Virginia, for a sum aggregating $320,000.

Six Mile Run, Penn.—Schipper Bros. Coal Mining Co. announces that it has just completed a tipple at its Broadtop Mine, on Six Mile Run, containing screens and picking belts for coal preparation. This company has also begun shipment from its new Crescent No. 7 Mine, on the Barnett seam, and has installed at its Ladysmith No. 5 Mine a new 10-ft. Brazil fan.

Columbus, Ohio—The Hocking Valley Ry. Co. was recently granted permission by the Ohio Public Service Commission to issue $1,000,000 of equipment trust notes for the purpose of buying new rolling stock and immediately upon the request being granted the company placed an order with the Ralston Steel Car Co. for 1000 steel battleship coal cars, which will be delivered about Oct. 1.

Washington, D. C.—One of the largest petitions ever presented to Congress from a single congressional district has been submitted to the House by Representative W. N. Carr, of Uniontown, Penn., in behalf of 13,500 employees of the H. C. Frick Coke Co. These men ask Congress to prevent a proposed dissolution of the U. S. Steel Corporation, of which the H. C. Frick Coke Co. is a subsidiary.

Columbus, Ohio—It is reported in railway circles that the Baltimore & Ohio, owner of the Cincinnati, Hamilton & Dayton Ry. system is planning to take up the southern end of the Detroit, Toledo & Ironton Ry. between Jackson and Ironton. The Baltimore & Ohio has been seeking an outlet through that locality for some time and has already had such a route surveyed. The purchase of the southern division of the Detroit, Toledo & Ironton will eliminate the building of a new road.

Philadelphia, Penn.—The Manor Real Estate & Trust Co., of Philadelphia, representing purchasing and holding companies of the Pennsylvania R.R. have concluded the purchase of seven tracts of coal land in Greene and Cherryhill Townships, Indiana County, the average price paid per acre being $70. The coal here purchased adjoins a large tract of nearly 15,000 acres recently taken over by the Manor Co. from the Greenridge Coal Co. Total payments in Indiana Co. aggregated $45,000.

Mobile, Ala.—The collier "Blossburg," owned by the Pratt Consolidated Coal Co., which was constructed at Pascagoula and Mobile has been put into service. This vessel is the only collier of its kind and is 150 ft. long, 36 ft. beam and 11 ft. deep. It has a carrying capacity of 1600 tons of coal and can bunker a steamer at the rate of 200 tons per hour. Furthermore, all classes of vessels from the smallest tug to the largest steamer can be more economically bunkered than from coal barges of the old type.

Pittsburgh, Penn.—It has been announced that the J. H. Hillman & Sons Co. has bought a controlling interest in the Bessemer Coal & Coke Co., which owns approximately 3300 acres of coking coal in the Connellsville and Klondyke region. By acquiring the controlling interest in the Bessemer Coke Co., the J. H. Hillman & Sons Co. now becomes the largest shipper of coke in the country. This firm now has an annual shipment of 3,500,000 tons of coke, and a large quantity of bituminous coal to all parts of the United States and Mexico.

COAL TRADE REVIEWS

GENERAL REVIEW

Heavy demand for bituminous continues unabated. Consumers, however, are becoming more cautious about future commitments. Buying more scattered. Anthracite moderately dull, but normal under the curtailed production.

With the August anthracite circular now in effect, there is little interest shown in getting coal forward, although there is a large tonnage moving at the full circular, and any further curtailment in production is unlikely. The companies appear to be disposing of the restricted production without any serious trouble, although there is considerable individual coal being sold down to the regular April circular, or less. The steam grades are showing some indication of improvement.

The broad heavy consumption of bituminous continues unabated, and the trade is now beginning to contemplate what the situation will be in the fall. Indications are that the current month will be the best August in the history of the soft-coal market, but the situation will turn entirely on the production. While the outlook for increased shipments is not encouraging at the moment, the possibility of a heavier movement is tending to give an easier tone to the market. Spot tonnages have not been particularly strong, especially where accumulations have occurred; buying is also more scattered and of an emergency kind, but prices continue firm. Consumers are becoming more cautious about orders into the future, and there is a feeling developing at some points that there is a possibility of a temporary slump.

Railroads in the Pittsburgh district are moving coal better than was expected, but there is sufficient congestion to cause some anxiety over the future. There is little new demand, but it is also doubtful if any important tonnage could be contracted for at the circular; production is up to full capacity. Outlying districts appear to be only waiting for Pittsburgh to take the initiative in the matter of advancing quotations. The only uncertainty in the situation at the present moment appears to be the contradictory conditions of the iron and coal markets. Ordinarily, these act in perfect sympathy with each other, but the reverse obtains now and the situation is highly puzzling to those effected.

The increased circular, effective the first of the current month in Ohio, is being strongly held, and the demand remains insistent. Production has been curtailed during the week by the restricted car supply which is now becoming a feature of the situation. There is no further doubt that the Lake shipping for the year will exceed all previous records. The companies at Hampton Roads are catching up on the contracts, because of heavier shipments from the mines, and there is also a larger movement in the coastwise and foreign trade. The tonnages in the West and Northwest, from West Virginia are unusually large.

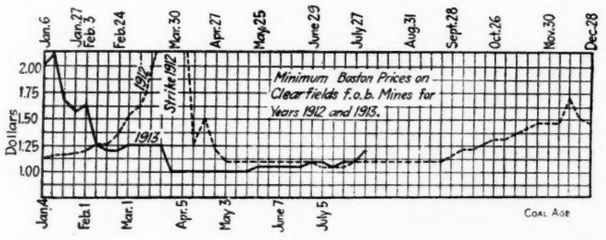
The car shortage in the extreme Southern market is causing a great deal of anxiety over what the situation will be this fall; coke is somewhat weaker because of the closing of a number of the iron furnaces. Prices in the Middlewest are being firmly held with some advances occasionally recorded. It appears to be doubtful if the operator can produce sufficient coal to meet the demand, particularly with the car and labor shortage which is becoming steadily worse.

BOSTON, MASS.

Generally a milder tone to bituminous, but it is considered only temporary. Interest still active in the probable output of West Virginia the next three months and prices continue firm. Difference among companies in charging Pennsylvania state tax.

Bituminous—The situation here continues without marked change, and what interest is shown is apparently confined to conjectures over what are likely to be the developments later. In that respect, there has been no pronounced trend, and the fall market will turn on the size of the output of Pocahontas and New River the next two or three months. Gains so far, since the resumption of mining, July 7, have been slow, but better loading is promised at all the Hampton Roads piers the next fortnight. On the whole, clear weather and the good movement of transportation coastwise help give the situation just now a milder tone, although it is recognized that there are other factors that are almost sure to make the outlook serious before many weeks. Prices are as firm as at any time since July, but buying is scattered and on Pocahontas and New River, only of an emergency character. There is a feeling in some circles, however, that within the month there will be a quiet time when prices will recede for a little, even though still later there is an upward movement that will extend into the winter.

From Pennsylvania shipments have lately been coming more slowly and there are further reports of labor shortage, of a surplus of business, and in some sections even of a limited car supply. Prices are without change, and few shippers are lacking an abundance of August business. A cautious policy is still being observed with regard to deferred deliveries. In Georges Creek the same condition is true, only with more emphasis. Practically no shipments are being made except on contract obligations, and then only in relatively small allowances to each consignment.



Water Freights are still easy, with few vessels offering. Steamer charters have been made for a series of trips on the basis of 70c. Hampton Roads to Boston points. That is about the rate on sailing vessels and barges, but dispatch has been so poor that shippers have hitherto been disinclined to charter beyond what they were obligated to take.

Anthracite—With August prices in force, there is little interest in getting hard coal forward. The advance of 25c. at retail in Boston, Aug. 1, making egg, stove and chestnut respectively $7.50, $7.75 and $8, has stimulated the demand from consumers and this will be reflected later in the month in orders filed with the companies. August will probably show a heavier tonnage movement than July and the fact that some consignees were too late in entering requisitions then, will influence retailers to get started earlier this month. Broken and screenings are notably in short supply.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	$1.15@1.50	$1.35@1.65	$1.67@1.77	
Philadelphia*	2.40@2.75	2.60@2.90	2.92@3.02	
New York*	2.70@3.05	2.90@3.20	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				$2.85@3.10
Providence†				3.95@4.10
Boston†				4.05@4.15

*F.o.b. †On cars.

NEW YORK

Bituminous is still in heavy demand, but the trade is inclined to be spasmodic and uncertain. Prepared sizes of hard coal are holding their own and trade is about normal for this period.

Bituminous—The strength in the local soft-coal market continues unchanged, but is more of a spasmodic nature now. Inquiries will be numerous one day, and then followed by possibly several days of no business whatever. However, in a general way there has been no easing off in the situation, and the prices continue as firm as ever. One of the reasons advanced for the unusually strong market is a heavy stocking movement on the part of the railroads. Last year the roads were forced to pay a comparatively good price for their coal requirements during the winter; this is the first time this had occurred for a number of years, and they do not propose to contend with the same condition this winter.

It would be a difficult proposition to place any important contract running to the end of the year now, and almost, if not quite impossible, to contract up to Apr. 1, 1914. The car supply has begun to tighten up on the Baltimore & Ohio, this

road now supplying only about 50 per cent. requirement; there is some indication of a tightening in this respect on the Pennsylvania, but less on the New York Central, and both of these roads are handling the situation in excellent shape so far. The New York market is not quotably changed, and we continue prices as follows:

West Virginia steam, $2.55@2.60; fair grades of Pennsylvania, $2.75@2.80; good grades of Pennsylvania, $2.80@2.85; best Miller Pennsylvania, $3.10@3.20; George's Creek, $3.25@3.30.

Anthracite—The hard-coal market continues rather dull and uninteresting, but in probably better condition than normally at this period of the year. The demand is still holding good, and although there is considerable price cutting, there is at the same time a large tonnage moving at the circular figure.

Production is being still further restricted, most of the large operations now probably working on a basis of about four days per week. As a result of this curtailed output, there is little coal going into storage, although some of the smaller steam grades continue to accumulate. Stove coal is still the shortest in supply. The market is quotable as follows:

		Individual	
	Circular	Lehigh	Scranton
Broken	$4.70	$4.45@4.85	$4.50@4.90
Egg	4.95	4.95@5.10	5.05@5.15
Stove	4.95	5.10@5.20	5.15
Chestnut	5.15	5.25@5.35	5.40
Pea	3.50	3.30@3.45	3.35@3.50
Buckwheat	2.75	2.15@2.45	2.55@2.75
Rice	2.25	1.70@1.95	2.25
Barley	1.75	1.30@1.70	1.75

PHILADELPHIA, PENN.

The anthracite trade, under restricted mining, still holding fair. All sizes moving off with possible exception of chestnut. Individuals still cutting prices, with concessions below April circular on some sizes. Bituminous continues on the high wave of prosperity.

The anthracite coal trade during the past week has developed nothing new, although operators claim that, with the restricted mining, they are able to dispose of most, if not all of the production. There is even a little better tone to the market as regards the small sizes. Chestnut seems to be about the only slow grade and broken is far in excess of the supply; this latter size is apparently coming into greater demand, or else there is less being made, for the companies sometimes find themselves hard pressed to cover current requisitions, and in some cases, are compelled to turn down new business.

The retail trade is in about the same condition as reported last week, and is not likely to show any improvement during the present month. There is some talk of a further restriction of mining during August. It is understood that most of the companies are now operating on the four days per week basis, but if the present demand keeps up, it is more than likely that further restriction will not be necessary. The individuals continue quoting exceptionally low prices, in some cases less than the April figures having been made, and there is also a great deal of jockeying with the Pennsylvania State tax. Nevertheless there is a large tonnage moving at the full circular prices.

The bituminous industry is on the end of its second month of prosperity. It is confidently expected, in fact, the condition already actually exists at some points, of quotations at least forty-five to fifty per cent. over those of last year at the corresponding period, and the trade is even looking for better things in the way of prices, although a conservative attitude is maintained by many.

PITTSBURGH, PENN.

Shipments close to actual capacity. Movement good so far but sufficient congestion to make the outlook disturbing. Coke situation uncertain. Furnaces appear less averse to meeting the producers' figures.

Bituminous—Coal shipments continue heavy, mining being very close to actual capacity. There is some congestion on the railroads, not a great deal, but sufficient to make a somewhat threatening situation for the future. On the whole, the railroads are moving the coal more expeditiously than was expected, shippers having seriously contended that the railroads were quite short of motive power. Fresh demand is relatively light but capacity is so well taken up that it would be difficult, if not impossible, to place fresh contracts at the regular circular prices, which we continue to quote as follows: Slack, 90c.; nut and slack, $1.05; nut, $1.25; mine-run, $1.30; ¾-in., $1.40; 1¼-in. steam, $1.50; 1¼-in. domestic, $1.55, per ton at mine, Pittsburgh district. Slack is bringing the full circular price as a rule, though on one or two divisions slight concessions can be obtained on prompt lots, say 10@15c.

Connellsville Coke—Authentic information is relatively meager as to progress being made by the coke operators in closing out August furnace coke. It is understood that the Producers' Coke Co., which handles the output of a number of operators, has made several sales, at the $2.50 price. Independent operators have made at least two sales, aggregating 15,000 tons, at that price, not guaranteed against decline. Furnaces are less averse to paying the operators' price than they were in the case of July coke, chiefly because they find the pig iron market has been picking up, and a break in coke prices at this time would disturb pig iron. We quote: Prompt furnace, $2.50@2.60; contract furnace, $2.50; prompt foundry, $2.85@3; contract foundry, $2.85@3.

Since the beginning of July there has been restriction of production by operators who did not have all their coke sold, for a month or longer periods, in order to avoid possible price cutting in the prompt market which would disturb the contract market. In the past few days the claim has been made by some operators that the men are so averse to working full time that they could not increase their output if they tried. These statements are doubted in many quarters. As reported by the "Courier," shipments in the week ended July 26 aggregated 393,634 tons, a decrease of 6214 tons, the production being given at 393,333 tons, a decrease of 6371 tons.

BALTIMORE, MD.

The best summer trade in years. Little probability of any easing off before the fall demand opens up. Shipments continue heavy and consumers are asking for tonnages in excess of their contracts.

This is the best August in the history of the coal trade for years. The time has now come when the trade feels there will be no break in the good prices for bituminous coals that have held so far the present season. Most of the companies that handle soft coal are pretty well filled with orders, and at figures considerably above those of a year ago.

Inquiries are now coming in also, for business above the contract call, which, by the way, is excellent. Shipments continue heavy over the piers and the local call for fuel is also good. The rush of contract coal continues in the Lake trade and there will probably be no abatement in that direction until navigation closes. While spot tonnages have not been overstrong at some points where there has been an overaccumulation, still the mine prices are showing no signs of weakening. Poorer grades of Pennsylvania coal readily bring $1, and the better qualities are being quickly absorbed at from $1.25 to $1.40. The off quality West Virginia fuels are commanding 90c. to $1 at the mines, with the better grades at $1.15 and $1.20.

The anthracite business here continues rather dull. There will be the usual awakening about the middle of the next month, however. The export trade from this port continues heavy. Egypt is still figuring largely in the amount of coal sent out, the Consolidation Coal Co. handling most of the tonnage to Alexandria.

BUFFALO, N. Y.

Bituminous trade seriously considering an advance in the circular. Strong position of the coal market, as compared with iron, is puzzling business interests. Car supply much improved.

The bituminous trade is so strong that dealers believe they could hold an advance of 15 to 20c. a ton. A few notices have been sent out from certain mines to the effect that an advance of 5c. might be expected on Aug. 1, but as a rule the trade here is waiting for the big companies in Pittsburgh to take the lead. Other branches of business appear to be watching bituminous coal and wondering how it manages to hold so firm when iron is dull. There was never so much iron ore moving on the Lakes as now and yet the tone of the iron trade is as uncertain as ever. Consumption is heavy at least, and users of manufactured iron are complaining that they cannot get anything like prompt deliveries.

Still there are quite a good many furnaces in the vicinity of Buffalo shut down on the complaint that there is no profit in pig iron. Everybody is puzzled over the contradictory condition in business, but the coal interests continue producing at maximum all their full capacity. Coal sells itself, and there would be no salesmen out if it was not expected that old conditions would return. The only drawback to the trade is the scarcity of money. Canada is much more poorly supplied than this country, especially since the government promised to release a large amount for general use. There is no complaint of car scarcity, though they are not plenty; the main difficulty is that the loaded cars move so slowly. Only after a shipper has made serious complaint that the consignee of a stranded car is running out of coal, does it begin to move again. Quotations of bituminous will, therefore, be $2.90 for Pittsburgh select lump, $2.80 for three-

quarter, $2.65 for mine-run and $2.15 for slack, all very strong. Coke is still weaker than coal and sells on the basis of $4.65 for best Connellsville foundry, f.o.b. cars at Buffalo.

There is no stir in the anthracite trade and none is looked for right away, as consumers are either hard at work in the field or off on vacations. Anthracite is in long supply and there is an excess of lake tonnage; some days more than a dozen big freighters leave this port light. The shipments of hard coal from this port for the week were 158,000 tons; for July, 780,632 tons and for the season, 2,566,206 tons. Last season to August the shipment was only 1,087,385 tons, owing to the late start, due to the mining suspension.

TOLEDO, OHIO

Toledo docks will undoubtedly establish a new high record during the current year. Car supply good so far. Steam and domestic grades in good demand and prices are strong.

The coal trade continues to be a rushing business in Toledo, especially in Lake shipments. This will undoubtedly prove a banner year for the Toledo Lake coal trade, although next year when the new Hocking docks are completed it is expected that a much greater tonnage will diverted to this port. The demand continues good for both domestic and steam coal and also for the fine grades. Thus far there has been no shortage of cars, although some dealers are fearful that there will be a little later on when crops begin to move, as this section has had a record yield. There has been plenty of coal thus far to supply the trade and much of it is now going up the Lakes.

The C. H. & D. docks have loaded 100,000 tons of coal during the past year and there are now four boats loading, each of from eight to ten thousand tons capacity. The Hocking and T. & O. C. docks have been loading to the limit of their capacity.

Prices quoted here are as follows:

	Pocahontas	Hocking	Jackson	Pomeroy	Massilon	Pitts. No. 8	Cambridge
Domestic lump	$2.50	$1.60	$2.50	$1.75	$2.50	$1.35	$1.35
Egg	2.50	1.20	2.50	1.50	2.50	....	....
Nut	2.00	1.20	2.25	1.50	2.50	....	....
¾ lump	....	1.35	....	....	....	1.20	1.20
Mine-run	1.60	1.15	....	....	....	1.10	1.10
Slack	....	0.70	....	....	....	0.80	....

LOUISVILLE, KY.

The heavy movement into the West and Northwest continues unabated. Storing of winter coal is strengthening the domestic market. Some producers so rushed they are unable to supply their regular trade.

After an almost imperceptible slackening up, the market has again resumed its former activity and is even stronger than before. The most important feature is the continued heavy movement into the Northwestern market, principally through Chicago, although there are numerous orders from points west of the Mississippi. Eastern Kentucky operators, especially those in the Harlan field, are obtaining the greatest benefit from this heavy demand; many of them are so rushed with orders that they are unable to supply their regular customers. This is the general condition throughout eastern Kentucky, and no relief is in sight until the production is much improved, there being considerable development now under way.

The generally firm condition of the market has naturally had a stiffening effect upon prices. The good grade domestic coals from eastern Kentucky are selling at $1.85 to $2 a ton, f.o.b. mines, for block, with block and lump at 10 to 15c. less, and round 25 to 35c. less. The September selling basis will be $2.10 to $2.25 for block, with the other grades in proportion as indicated. Nut and slack is in fairly good supply at 60 to 75c. for the better grades, the off qualities being from 40 to 50 cents.

COLUMBUS, OHIO

Demand is good for all grades. The feature of the trade is the advance in the circular, effective Aug. 1, which is being well maintained. Production is curtailed by a growing car shortage. The tone of the market is good.

Demand for all grades of coal has been good during the past week. The tone of the market is satisfactory and the advanced circular, effective Aug. 1, is being well maintained. Price cutting is not common and is only done in a few instances. The outlook for the future is considered good in every way.

Car shortage is making its appearance and as a result the output from the various mining districts is being curtailed to a certain extent. In eastern Ohio the car shortage is the worst and consequently the production is estimated at only about 65 per cent. of normal; it has also appeared in the Hocking Valley and the output is about 80 per cent. of the average in that section. In the Pomeroy Bend district some trouble over lack of cars is reported and the same is true of the domestic fields of Jackson.

Domestic business is holding up well despite the extremely hot weather. Dealers' stocks are pretty large and they are not buying for immediate delivery at present. Municipal and school contracts are requiring some attention and there is a good demand for Pocahontas in this territory at prices considerably higher than a year ago. Some of the larger householders have placed their contracts for the coming season. Retail prices are higher, in conformity with the advanced circular.

Lake trade is good although there is a slight falling off in the volume, due to car shortage and scarcity of labor. No congestion of consequence is reported from the docks at the upper lake ports. The movement to the interior has started and there are no indications of a congestion. There is a good demand from plants making iron and steel and also from factories in many other lines. There is no disposition to stock up at this time although it is believed some stocking will be done soon to guard against a possible suspension after Apr. 1, when the present mining scale expires. Railroads are using a fair amount of fuel.

Quotations in the Ohio fields are as follows:

	Hocking	Pittsburg	Pomeroy	Kanawha
Domestic lump	$1.70 @ 1.65	.....	$1.70 @ 1.65	$1.70 @ 1.65
3-4 inch	1.55 @ 1.50	$1.35 @ 1.30	1.45 @ 1.40	1.50 @ 1.40
Nut	1.30 @ 1.20	.....	1.35 @ 1.30	.....
Mine-run	1.35 @ 1.25	1.15 @ 1.10	1.30 @ 1.25	1.25 @ 1.20
Nut, pea and slack	0.65 @ 0.60	.....	0.60 @ 0.55	0.60 @ 0.55
Coarse slack	0.55 @ 0.50	0.70 @ 0.65	0.50 @ 0.45	0.50 @ 0.45

HAMPTON ROADS, VA.

Shippers well caught up on contracts, although dumpings for the week were light. Movement from the mines was heavy and also the shipments in both the foreign and coastwise trade. Prices firm.

Dumpings over the Hampton Roads piers during the week have fallen below expectation. However, there has been a continued heavy movement in from the mines, and wholesalers have caught up on their contracts, some even having free coal remaining on track in the yards, although this will no doubt find a ready application on contract. The export and coastwise movement still continues heavy with prices firm at $2.95 to $3 for Pocahontas and New River, and $2.60 to $2.75 for Kanawaha for deliveries during the current month and early in September.

The dumping over the Hampton Roads pier for July amounted to 934,672 tons. The Norfolk & Western R.R. led with a tonnage of 513,951 tons, at the Lambert Point pier, the Virginia Ry. being second, with 221,064 tons at Sewalls Point, while the Chesapeake & Ohio Ry. dumped 199,747 tons at Newport News.

BIRMINGHAM, ALA.

Operators complaining vigorously about the inadequate car supply. Indications point to an acute situation when the fall demand opens up. Optimistic outlook for the winter trade.

The most interesting feature in the local market is the vigorous complaints from the operators about the inadequate supply of cars, which they claim is worse than for some months past. The lack of equipment at this time when the shipments are comparatively light is causing considerable apprehension over what the situation will be when the fall demand opens up.

Furnace coke is slightly weaker, due to the closing down of a number of blast furnaces, but foundry coke appears strong with prices being well maintained. Smithing coal is experiencing the customary summer dullness, and the price level has been reduced in order to stimulate buying. Business conditions generally in the South are excellent and the trade is inclined to take an optimistic view over the immediate future of the coal business.

DETROIT, MICH.

Shortage in the car and labor supply is restricting production and causing uneasiness. Pocahontas grades are stiff and becoming more difficult to obtain.

Bituminous—The car supply is becoming steadily worse and operators are seriously handicapped in their efforts to produce sufficient coal to meet the heavy demand. There is also considerable apprehension expressed over the inadequate supply of labor and indications are that high quotations will prevail locally before the end of September, with coal difficult to obtain at that. Prices on contracts are being maintained in every respect, several large tonnages being closed during the week.

Anthracite—All of the big hard coalers, with the exception of the D. L. & W. have announced a uniform advance of 10c. per ton on the circular to cover the new 2½ per cent. Pennsylvania state tax on anthracite.

Coke—Coke is becoming somewhat stronger and will apparently continue to improve from now on. Semet Solvay is

quotable at $3.75 with gas house at $3.50 and Connellsville at $3 all f.o.b.

The local market is now quotable on about the following basis:

	W. Va. Splint	Gas	Hocking	Cambridge	No. 8 Ohio	Pocahontas	Jackson Hill
Domestic lump.	$1.50	....	$1.60	....	....	$2.50	$2.25
Egg	1.50	....	1.60	....	....	2.50	2.25
Steam lump	1.30	....	....	....	....	....	....
¾-in. lump	1.15	$1.15	1.10	$1.10	$1.10	....	....
Mine-run	1.10	1.10	1.05	1.05	1.05	1.50	....
Slack	0.90	0.95	0.60	0.70	0.70	....	....

ST. LOUIS, MO.

The anticipated advance in the Carterville and Franklin County coals took place Aug. 1. Standard grades are moving more freely. Anthracite and coke are completely demoralized.

As had been anticipated, Aug. 1 brought a surprise in the way of an advance on Carterville and Franklin County coal, although there are indications that some of these may only be temporary, as the local demand has been caused largely by a lot of speculation on the part of jobbers who figured on having a good demand in the first half of the month. The country demand is fairly good from points in Missouri and the North, but in the South there is nothing as yet.

Standard coal is moving a trifle more freely, but the same old proposition exists where it is being sold for less than cost. Standard screenings are down from 40c. to 45c. and, of course, this means that 2-in. lump is hovering around 90c. to 95c.; 6-in. has advanced to about $1.10, and everything indicates that Standard lump will continue to advance because it is a certainty that screenings will continue to drop.

Very little anthracite moving in, and the market is in a demoralized condition and the same thing applies to coke.

The prevailing circular is:

	Carterville and Franklin Co.	Big Muddy	Mt. Olive	Standard
2-in. lump	.....	.....	.....	$0.90
3-in. lump	.....	.....	$1.25	.....
6-in. lump	$1.35 @ 1.50	.....	1.35	1.10
Lump and egg	.....	$2.10	1.30	.....
No. 1 nut	1.15 @ 1.30	.....	1.05	0.87½
Screenings	0.65	.....	.....	0.80
Mine-run	1.10	.....	.....	0.75
No. 1 washed nut	1.50	.....	.....	.....
No. 2 washed nut	1.30	.....	.....	.....
No. 3 washed nut	1.20	.....	.....	.....
No. 4 washed nut	1.10	.....	.....	.....
No. 5 washed nut	0.80	.....	.....	.....

PORTLAND, ORE.

Trade holding up good for this period of the year. Considerable Utah coal coming in because of the British Columbia strike.

There is nothing of particular significance to report this week from the coal trade in this section, except that business is keeping up quite steady for this time of year. Utah coal is being sold here in considerable quantities, with less Washington fuel owing to the home demand which has been heavy for some time on account of the strike in the British Columbia mines.

While prices increased 25c. per ton at the mines on Aug. 1, dealers here are of the opinion that the increase will not affect retail prices, but will be absorbed by themselves. A fair volume of business is looked for this winter.

PRODUCTION AND TRANSPORTATION STATISTICS

BALTIMORE & OHIO

The following is a comparative statement of the coal and coke movement over this road for June and the first six months of this year and last year:

	June		Six Months	
	1913	1912	1913	1912
Coal	3,061,929	2,591,318	16,665,968	15,148,448
Coke	396,920	424,009	2,447,888	2,284,892
Total	3,458,849	3,015,327	19,113,856	17,433,340

VIRGINIAN RAILWAY

Total shipments of coal over this road for June of the current year were 304,030 tons as compared with 256,070 tons for the same month last year. For the five months to June 31 of the current year, the shipments were 2,201,033 tons as compared with 1,662,917 tons for the same period last year.

IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports in the United States for May, 1912-13, and for the eleven months ending May, 1911-12-13, in long tons:

	11 Months			May	
Imports from:	1911	1912	1913	1912	1913
United Kingdom	13,186	6,691	8,750	600	200
Canada	1,392,770	963,033	1,255,854	112,682	74,638
Japan	14,481	13,165	78,812	230	12,315
Australia & Tasmania	259,791	182,266	140,825	19,399	10,840
Other countries	4,821	1,992	3,257	48	.....
Total	1,685,049	1,167,147	1,487,498	132,959	97,993
Exports:					
Anthracite	2,805,724	2,677,133	4,206,746	18,019	505,305
Bituminous,					
Canada	7,554,140	9,613,219	10,563,330	1,048,155	1,470,590
Panama	470,297	447,412	443,249	57,769	49,800
Mexico	590,976	306,072	406,249	39,536	56,048
Cuba	860,239	1,032,532	1,167,681	113,785	132,571
West Indies	481,534	649,226	550,055	71,681	47,164
Other countries	570,816	1,300,897	1,059,036	155,288	147,737
Total	10,528,002	13,349,358	14,189,600	1,486,214	1,903,910
Bunker coal	5,920,979	6,525,093	6,666,494	693,063	690,228

NORFOLK & WESTERN RY.

The following is a statement of the tonnages shipped over this road during June, 1913, and for the six months ending June 30, as compared with corresponding periods of 1912 in short tons:

	June		Six Months	
Destination	1912	1913	1912	1913
Coal				
Tidewater, foreign	121,972	175,414	834,554	876,320
Tidewater, coastwise	297,636	262,574	1,814,298	1,903,318
Domestic	1,569,697	1,623,923	8,417,511	8,651,814
Coke				
Tidewater, foreign	3,070	.....	40,904	22,841
Domestic	97,527	123,941	701,308	817,801
Total	2,089,902	2,185,852	11,808,575	12,272,094

FOREIGN MARKETS

GREAT BRITAIN

July 25—The demand is more active for Admiralty large coals, which are firmly held both for prompt and forward delivery. Prices for other qualities are, however, irregular for immediate shipment.

Quotations are approximately as follows:

Best Welsh steam	$4.80@5.04	Best Monmouthshires	$4.08@4.20
Best seconds	4.56@4.68	Seconds	3.96@4.02
Seconds	4.32@4.50	Best Cardiff smalls	2.46@2.52
Best dry coals	4.32@4.56	Seconds	2.34@2.40

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport; both exclusive of wharfage, and for cash in 30 days.

GERMANY

Exports and Imports of fuel in Germany for May and the first five months were as follows:

	Exports			Imports		
	May		5 Mos.	May		5 Mos.
	1912	1913	1913	1912	1913	1913
Coal	2,480,522	2,288,587	13,687,651	882,846	952,624	4,071,183
Lignite	4,172	3,093	26,703	503,825	528,573	2,911,166
Coke	512,026	596,424	2,868,838	48,767	53,036	235,150
Coal briquettes	193,907	202,171	1,023,580	3,372	1,713	9,033
Lignite ditto	37,084	61,034	374,660	7,399	7,620	51,869

Production for May and the first five months of this year and last year was as follows:

	May		5 Mos.	
	1912	1913	1912	1913
Coal	14,734,098	14,268,674	66,938,122	73,414,129
Lignite	6,742,672	6,865,438	27,137,136	28,309,207
Coke	2,378,226	2,673,104	11,376,863	13,266,336
Coal briquettes	438,477	451,087	2,044,311	2,365,154
Lignite ditto	1,389,169	1,710,005	6,407,057	7,146,051

BRITISH WEST INDIES

The "Iron and Coal Trade Journal" (London, England), says in a recent issue:

The way in which coal from the United States has ousted British coal in the British West Indies is shown by the fact that supplies of bunker coal, representing approximately 40 per cent. of the imports, are drawn entirely from the United States. The last importation of bunker coal from the United Kingdom was in 1909.

FINANCIAL DEPARTMENT

The Elk Horn Fuel Co.

Character and Value of Properties—"The Elkhorn Coking Coal Field," in eastern Kentucky, has long been known to contain fuel of exceptional quality which has been unavailable to the market through lack of railway facilities. The land owned and under option by the Elk Horn Fuel Co. is about 60% of "The Elkhorn Coking Coal Field," and lies principally to the north of the recent development in the same field by the Consolidation Coal Co., and occupies mainly the watersheds between the Kentucky and Big Sandy Rivers and extends north along Beaver Creek and other tributaries of Big Sandy, Kentucky and Licking Rivers. It produces the highest grade of coking, gas-producing, openhearth malleable, and byproduct coal, and has proven to be one of the most valuable and uniform coals ever mined in this country. The lands are underlaid by the Elkhorn seam to the extent of 75% to 80% of the entire area; the barren area being caused by erosion of streams. The region will yield in recovery an average of 5500 net tons per acre, the seams running from 4 to 8 ft. in thickness. This coal is remarkably uniform in quality throughout the entire coking region

Mr. d'Invilliers in his report (which covers only a portion of the coal properties owned or controlled by the Elk Horn Fuel Co.) places a present valuation of $10,000,000 upon 110,133 acres of land and mineral rights owned by the Elk Horn Fuel Co. in "The Elkhorn Coking Coal Field," and 14,750 acres (represented by its stock ownership in the Beaver Creek Consolidated Coal Co.) and 4500 acres (represented by its stock ownership of the Mineral Fuel Co.) each in the same field. Messrs. Haas, Mayo and Fleming in their report place a realizable value at forced sale in excess of $15,000,000 on all of the property of the Elk Horn Fuel Co. (exclusive of the stock of the Consolidation Coal Co. owned by it). It is probable the value of the properties of the company largely exceeds the above figures, the property owned in fee and mineral rights, upon which the mortgage is a direct first lien, alone largely exceeding the value of $10,000,000.

Transportation Facilities—"The Elkhorn Coking Coal Field," hitherto inaccessible for lack of transportation facilities, now enjoys special advantages in this respect as the Louisville & Nashville, Chesapeake & Ohio, Baltimore & Ohio and the Carolina, Clinchfield & Ohio are now recognized factors in the development of this field.

The Louisville & Nashville is now in actual operation through the land of the Mineral Fuel Co. (all of the stock of which company is owned by the Elk Horn Fuel Co. subject to its mortgage), and is providing 5000 steel cars for its service. The Chesapeake & Ohio is constructing a branch approximately 22 miles long up the right fork of Beaver Creek, completion of which is guaranteed by contract for Jan. 1, 1914. This railroad is also under contract to construct, at its own expense, spurs aggregating 11 miles in length, as soon as the traffic conditions warrant. The railroad company has further agreed to build extensions necessary for the development of tonnage on Mud Creek. The Baltimore & Ohio has purchased a survey extending up the left fork of Beaver Creek, and its president states that they will commence the construction of this line at once. It has also acquired what is known as the Rockcastle survey (including considerable rights of way). The completion of these branches will afford ample transportation facilities for the development of this company's holdings in the Elkhorn field. The Carolina, Clinchfield & Ohio is now building a connection between Dante, Va., and the Chesapeake & Ohio at Elkhorn City, which line is expected to be in operation within a year and will give an important connection to Atlantic ports. The great value of this field is demonstrated by the interest the railroad companies are taking in its development, the expenditures made in this territory and those provided for by these companies representing a total investment of more than $55,000,000.

Market Conditions—There is a large and steadily increasing demand for Elkhorn coal, particularly by gas-producing plants. It is also used in large quantities in byproducts and coke plants, having demonstrated its superiority in the manufacture of metallurgical coke. The president of one Western company, of unquestionable financial responsibility, using large quantities of byproduct coal, states that within three years his plants alone will consume three and a half million tons of this grade of coal per annum.

There is a great and steadily increasing demand by malleable-iron plants which require a long, hot flame, practically free from sulphur. The expenditures of the railroads to reach this field and the greatly increased production are indicative of the marketability and rapidly increasing demand.

(For a further description of this property see Vol. 4, No. 2, page 74.)

The Clearfield Bituminous Coal Corporation—This concern was incorporated Oct. 7, 1886, under the laws of Pennsylvania. It owns land and mineral rights in Clearfield and Indiana counties, Penn., and has a capitalization of $825,000, all of which is owned by the New York Central and Hudson River R.R. On June 23, 1911, it foreclosed its mortgage on the properties of the Pennsylvania Coal & Coke Co., controlling about 106,000 acres in Blair, Cambria, Clearfield and Indiana counties, and has leased these properties to the Pennsylvania Coal & Coke Corporation.

Metropolitan Coal Co.

The Metropolitan Coal Co., incorporated under the laws of Massachusetts, has filed with the Massachusetts secretary of state a statement of its financial condition, dated Mar. 31, 1913, which we compare as follows:

Assets	1913	1912
Real estate and machinery	$800,041	$632,012
Material, stock in process	402,899	475,563
Steamers, tugs, etc	162,600	162,600
Cash and debts receivable	511,800	541,444
Horses and vehicles	159,893	164,704
Good-will	400,000	400,000
Securities	469,594	393,425
Total	2,906,829	2,769,750
Liabilities:		
Capital stock	1 500,000	1,378,400
Accounts payable*	716,829	751,350
Funded debt	250,000	200,000
Surplus	125,000	110,000
Floating debt	310,000	330,000
Reserve for bad debts	5,000	.....
Total	2,906,829	2,769,750

*Including $400,000 special stock.

COAL SECURITIES

The following table gives the range of various active coal securities and dividends paid during the week ending Aug. 2:

Stocks	Week's Range High	Week's Range Low	Week's Range Last	Year's Range High	Year's Range Low
American Coal Products	82	81	82	87	80
American Coal Products Pref	110	100	100	109½	105
Colorado Fuel & Iron	32½	29½	31¼	41¾	24½
Colorado Fuel & Iron Pref	....	....	155	155	150
Consolidation Coal of Maryland	102½	102½	102½	102½	102½
Lehigh Valley Coal Sales	195	190	190	....	....
Island Creek Coal Com	49½	47½	49	49	47½
Island Creek Coal Pref	81	80½	80½	81½	80
Pittsburgh Coal	19	18½	19	24¾	14½
Pittsburgh Coal Pref	83½	82	82½	95	73
Pond Creek	21	20	20	23¾	16½
Reading	163	158	158½	168¾	151¾
Reading 1st Pref	....	....	86	92½	86
Reading 2nd Pref	88¼	88¼	88¼	95	84
Virginia Iron, Coal & Coke	41¼	40	40	54	37½

Bonds	Closing Bid	Closing Asked	Week's Range or Last Sale		Year's Range	
Colo. F. & I. gen. s.f.g. 5s	93½	98	95½	July '13	93¾	99½
Colo. F. & I. gen. 6s	102½	..	107½	June '12	..	..
Col. Ind. 1st & coll. 5s. gu	82	83	80¾	82	77½	85
Cons. Ind. Coal Me. 1st 5s	..	..	85	June '11	..	..
Cons. Coal 1st and ref. 5s	..	92½	93	Oct. '12	..	..
Gr. Riv. Coal & C. 1st g 6s	..	100	102¾	April '06	..	..
K. & H. C. & C. 1st s f g 5s	..	96	98	Jan. '13	98	98
Pocah. Con. Coll. 1st s f 5s	..	86	86½	June '13	86	87½
St. L. Rky. Mt. & Pac. 1st 5s	81	82	80	80	73	80
Tenn. Coal gen. 5s	99½	99½	99¾	99¾ '13	99¾	103
Birm. Div. 1st consol. 6s	100½	102	101	April '13	101	103
Tenn. Div. 1st g 6s	100½	101½	100½	July '13	100½	102
Cah. C. M. Co. 1st g 6s	..	103	103	103	103	103
Utah Fuel 1st g 5s	..	..	....	....	..	..
Victor Fuel 1st s f 5s	..	80	80	May '13	79¾	80
Va. I. Coal & Coke 1st g 5s	92½	93	92½	92½	92	98

No Important Dividends were announced during the week.

Reading Co.—The earnings of this corporation for the five months to Nov. 30, 1912, amounted to $12,000,000, as against $7,350,000 in the same period of 1910, or about 1¾ times as much. That a great deal of this is due to the anthracite coal business is illustrated by the figures of the Coal & Iron Co., which showed $2,244,220 net for the five months of 1912, as compared with a deficit in 1910, and less than $275,000 profit in 1911 and 1909.

The Sunday Creek Coal Co.—This concern was incorporated in New Jersey, in June, 1905, taking over the property of the Sunday Creek Coal Co., which owns 16,300 acres of coal land and leases 250 acres. The new Sunday Creek Co. also leased properties allied to the Hocking Valley Ry. namely, the Kanawha & Hocking Coal & Coke Co., and the Continental Coal Co., which together control about 59,500 acres in West Virginia and Ohio, and the Buckeye Coal & Railway, and the Ohio Land & Railway, controlling 24,350 acres. The total acreage leased by the Sunday Creek Co. is 84,100 in addition to which it owns 16,300.